

14057

FROM CALCUTTA TO BOMBAY COASTING

BEING THE SECOND EDITION OF

THE HANDBOOK

TO THE

PORTS ON THE COAST OF INDIA

BETWEEN

CALCUTTA AND BOMBAY

INCLUDING

CEYLON

AND THE

MALDIVE AND LACCADIVE ISLANDS,

with Eleven Charts transferred from the British Admiralty Sheets by special permission of the Hydrographic Department, and also Twelve Unique Illustrations sketched from seaward of some of the principal Ports, Islands, and Lighthouses on the Coast.

BY

LIEUT. H. S. BROWN, R.N.R.

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LONDON:

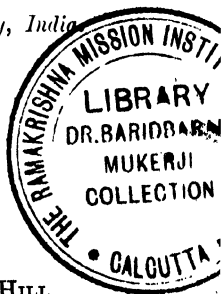
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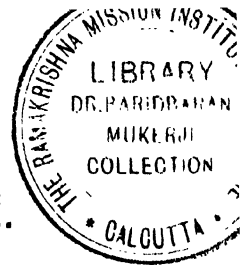
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PREFACE TO FIRST EDITION.

This book has been compiled during my leisure time with the hope that it may be of use to the Commanders of the many coasting steamers and to shipowners and others who are interested in the Ports of our great Indian Empire.

It is not intended as a Sailing Directory, but merely as an accurate description of the Ports, Lights, Anchorages, Beacons, Buoys, and the dangers on the coast, as they exist in 1897.

The historical notes have been taken from the most reliable sources, namely, from the works of Sir William Hunter, Colonels Yule and Thornton, and from the manuals of the various districts in the Madras Presidency.

The nautical portion has been condensed from Commander Taylor's Directory, Marshall's Handbook, from the Admiralty Pilots' and Hydrographic Notices, and from the surveys conducted by the officers of the Marine Survey of India.

Most of the information in the chapter on Ceylon has been condensed from Mr. Ferguson's works, to whom my acknowledgments and thanks are due.

I am indebted first to Commander H. A. Street, Royal Indian Marine, for much kind advice and encouragement.

I am also indebted to Commanders P. B. Creagh and G. A. Wilson, of the Royal Indian Marine, for most of the information regarding Calcutta and Bombay; to Mr. H. D. Baddeley, Personal Assistant to the Presidency Port Officer, for the remarks regarding Madras, and to the Naval Officer in charge of Marmagão for the Goanese Ports. For some of the information regarding the out-ports in the

Madras Presidency I am indebted to those of my brother Port Officers, who were kind enough to give me their assistance.

For the Ports in Travancore I am indebted to the kind co-operation of Mr. Maltby; and many of my old sea-friends have given me much valuable assistance.

I regret that it has been found impossible to illustrate the book owing to the difficulty and expense of getting the photographs taken from seaward; but this, I hope, will be overcome, if the book is sufficiently well thought of to merit a second edition. Amongst the Appendices will be found much useful information, and the Port Rules for the three Presidencies and other matter have been added at the request of many of my old friends in the British India Company, so that they may be always on the chart-room table for handy reference.

All bearings given in this book are magnetic.

In conclusion, though no pains have been spared and every precaution taken, it is impossible but that some mistakes will be found, and I beg that any omissions or inaccuracies may be brought to my notice with a view to another edition being more perfect and useful.

H. S. BROWN,

MANGALORE.

September, 1897.

PREFACE TO SECOND EDITION.



The very favourable way in which my book has been received has induced me to persevere in improving and keeping it up to date.

A great deal of trouble has been taken in obtaining good illustrations sketched from seaward, for which I am indebted to Lieutenant J. H. H. Hand, R.I.M., and Mr. A. Peyton, of the Indian Marine Survey.

The various suggestions brought to my notice from time to time for improving the work have been attended to, and several new chapters have been written.

The account of the Pearl and Chank Fisheries has been entirely rewritten, and the chapter on the Laccadive Islands has been improved and added to.

As it has been pointed out by many of my friends that the work could not be considered complete without a series of Charts, special permission has been obtained from the Hydrographic Department to reproduce from all the latest Admiralty Sheets of the Coasts of India and Ceylon the Charts included in the book.

H. S. BROWN,

LONDON.

June, 1902.

PRESS OPINIONS.

The SHIPPING WORLD says:—

“ This capital little guide, compiled by the Port Officer of Mangalore, whose intimate acquaintance with that coast enables him to furnish much useful and interesting information for those who may visit these ports, is a book which we can heartily recommend.

“ All trading and navigation particulars are given; tonnage and pilotage dues, currents, buoys, lights, port bye-laws, boat hire, and meteorological signals are dealt with in turn, while the interest is considerably heightened by the amount of historical information to be found in its pages.

“ One thing only it lacks—illustrations would add much to its usefulness.”

The MADRAS MAIL says:—

“ About 25 years have elapsed since the publication of a compact and useful guide to the Ports of this Presidency and Ceylon by Captain Marshall, formerly Deputy Conservator of the Port of Madras.

“ For many years this work was in great demand; but since the retirement of the compiler many changes have taken place.

“ These changes are so numerous that a revision of Captain Marshall's handbook would have scarcely met requirements; and a new publication was much needed.

“ This want has now been supplied by Lieutenant H. S. Brown, R.N.R., Port Officer at Mangalore, in a neat little volume of 350 pages, of which nearly half are devoted to appendices containing the rules of the various ports, signals, port-dues, boat-hire charges, etc. The compiler has extended the scope of the book to the Ports of Calcutta on the East and of Bombay on the West Coast, an addition which will be very generally appreciated.

“ The work is very exhaustive and complete, and should be popular with the shipping community.

“ In conclusion, we congratulate Lieutenant Brown on having supplied a very real want, and wish him every success in the circulation of the work, of which we hope shortly to see a second and an illustrated edition.”

THE NAUTICAL MAGAZINE says:—

“This really useful addition to the already voluminous works appealing to navigators has been compiled evidently with great care.

“It deals with all the ports and the coast-line between Calcutta and Bombay, including Ceylon. If the work is properly pushed and once becomes known, we have little doubt that the author will be rewarded by its receiving plenty of attention at the hands of navigators in Indian waters.

“The information given is most complete, and deals with the many and various peculiarities of harbours in this part of the world, and the very divergent harbour regulations in force at various ports.

“It also clearly defines coasts lights and warnings, currents, etc., and is an able general directory to navigation in these waters.

“The scope of the book is far wider than we are able to detail here.

“It is concise, easy of reference, and most complete, and is a highly-meritorious effort at defining the necessities of navigation in waters that can well carry further statistics and information.”

THE CEYLON OBSERVER says:—

“We have received a copy of a Handbook to the Ports on the Coast of India between Calcutta and Bombay.

“The volume covering some 350 pages is very conveniently compiled, with Contents and Index, and contains in a handy form a great amount of information in every-day request.

“There can be no doubt that Captain Brown has met a felt want in a very creditable and efficient manner.”

CAPTAIN GRUCHY, of the British India Company, writes as follows:—

“I have found your hand-book invaluable, went by it for every port, and never had to shift my anchorage once. It is a most useful book for masters on the coast.”

And many others from masters and owners too numerous to mention.

CONTENTS.

| | PAGE |
|--|------|
| Uniform System of Buoyage | 9 |
| CHAPTER I. Ports in the Bengal Presidency: Calcutta to Puri | 11 |
| Rules for the Port of Calcutta | 30 |
| Bye-laws | 35 |
| Rules under Explosives Acts IV. of 1884 | 40 |
| Scale of Charges of Kidderpore Graving Dock | 42 |
| Rules under Petroleum Act XII. of 1886 | 43 |
| CHAPTER II. Eastern Ports in the Madras Presidency: Ganjam to Manapad | 56 |
| Rates of Port Dues in the Madras Presidency | 95 |
| Instructions to Commanders visiting the Port of Madras | 101 |
| Instructions to Commanders of Vessels visiting Coast-Ports | 107 |
| Port Signals | 111 |
| Scale of Fees for Measuring and Surveying Vessels | 112 |
| Port Rules for Madras | 114 |
| Special Notice to Commanders of Vessels visiting Madras | 117 |
| Meteorological Meaning of the Commercial Code-Flags | 118 |
| Port Rules for all the Coast Ports | 120 |
| Madras Cyclone Code | 128 |
| Bye-Laws of the Harbour Trust Board (Madras). | 135 |
| General Pass Rules | 136 |
| CHAPTER III. Ports in the Island of Ceylon and Maldivé Islands | 181 |
| Colombo Port Rules | 201 |
| Rates of Agency and Commission adopted by Colombo Chamber of Commerce | 203 |
| CHAPTER IV. Western Ports in Native States and Madras Presidency: Tuticorin to Siroor | 217 |
| The Laccadive Islands | 260 |
| Cochin Tonnage Scale | 233 |
| CHAPTER V. Ports in the Bombay Presidency: Bhatkal to Bombay | 269 |
| Bombay Port Rules | 317 |
| Storm Warning Signals | 322 |
| Special Port Signals | 323 |
| Bombay Chamber of Commerce Rules | 325 |
| Madras and Coromandel Tonnage Scale | 326 |
| Bengal Tonnage Scale | 327 |
| Tonnage Schedule for all Parts of India | 327 |
| Revised Regulations for preventing Collisions at Sea | 342 |
| Basses and Minicoy Light Dues and Straits Light Dues | 349 |
| Use of Oil as a Sea-Smoother | 351 |
| Index | 353 |

Uniform System of Buoyage.



The system is as follows :—

1. The Mariner, when approaching the coast, must determine his position on the chart, and must note the direction of the main stream of flood tide.
2. The term “Starboard Hand” shall denote that side which would be on the right hand of the Mariner, either going with the main stream of flood, or entering a harbour, river, or estuary from seaward; the term “Port Hand” shall denote the left hand of the Mariner under the same circumstances.
3. Buoys showing the pointed top of a cone above water shall be called “Conical,” and shall always be Starboard Hand buoys, as above defined.
4. Buoys showing a flat top above water shall be called “Can,” and shall always be Port Hand buoys, as above defined.
5. Buoys showing a domed top above water shall be called “Spherical,” and shall mark the ends of Middle Grounds.
6. Buoys having a tall central structure on a broad base shall be called “Pillar buoys,” and like other special buoys, such as Bell buoys, Gas buoys, Automatic Sounding buoys, etc., etc., shall be placed to mark special positions, either on the coast or in the approaches to harbours, etc.
7. Buoys showing only a mast above water shall be called Spar buoys.
8. Starboard Hand buoys shall always be painted a single red colour.
9. Port Hand buoys shall be painted of another characteristic colour, either black or parti-colour.
10. Spherical buoys at the ends of Middle Grounds shall always be distinguished by horizontal stripes of white colour.
11. Surmounting top-marks, such as staff and cone, etc., shall always be painted of one dark colour.
12. Staff and Cone shall only be used on Starboard Hand buoys; Staff and Cylinder on Port Hand; Globes at the outer ends of Middle Grounds; and Half Globes, round part uppermost, at the inner ends.
13. Buoys on the same side of a channel, estuary, or tideway, may be distinguished from each other by names or consecutive numbers or letters, commencing from seaward, and when necessary by a staff, surmounted by the appropriate topmark.
14. Fairway buoys shall always be painted in horizontal stripes of white colour, and shall be surmounted by a staff only.
15. Buoys intended for mooring, etc., may be of shape or colour according to the discretion of the Authority within whose jurisdiction they are laid, but for marking Submarine Telegraph Cables the colours shall be green, with the word “Telegraph” painted thereon in white letters.

Buoying and marking of Wrecks :—

16. Wreck buoys in the open sea, or in the approaches to a harbour, or estuary, shall be coloured green, with the word "Wreck" painted in white letters on them.

17. When possible the buoy shall be laid near to the side of the wreck next to mid-channel.

18. When a wreck-marking vessel is used, it shall, if possible, have its top-sides coloured green, with the word "Wreck" in white letters thereon, and shall exhibit :—

By Day.—Three balls on a yard 20 feet above the sea, two placed vertically at one end, and one at the other, the single ball being on the side nearest to the wreck.

By Night.—Three fixed white lights, similarly arranged, but not the ordinary riding light.

19. In narrow waters, or in rivers, harbours, etc., under the jurisdiction of local Authorities, the same rules may be adopted, or, at discretion, varied as follows :—

When a wreck-marking vessel is used, she shall carry a yard on a mast, with two balls by day, placed horizontally, not less than 6 nor more than 12 feet apart, and two lights by night, similarly placed.

When a barge or boat only is used a flag or ball may be shown in the day-time.

The position in which the marking vessel is placed, with reference to the wreck shall be at the discretion of the local Authority having jurisdiction.



CHAPTER I.

Ports in the Bengal Presidency.



CALCUTTA, in Latitude $22^{\circ} 33' N.$, Longitude $88^{\circ} 20' E.$, is the principal port and capital of Bengal, and has a population of over 900,000. It is situated on the left bank of the river Hoogley, 83 miles from Saugor Island, which is the southern extremity of the land, or 120 miles from the Pilot Station off the tails of the outlying sands.

In 1596, Calcutta, or as then known Kalikata, was a small village, and its history practically dates from 1686, when the English left the town of Hugli and settled at a village, close to the present Chitpur Bridge, and gradually extended down the river to somewhere between the present Custom House and the Mint, and some years afterwards down to Fort William. It became the head-quarters of the East India Company in 1689, and it was formally purchased from the son of the Emperor Aurangzeb in 1700 A.D.

The original Fort William was built in 1696 and was captured in 1756 by the Nawab of Bengal. In 1757, however, the British again took possession of the city, from which time modern Calcutta dates. The present Fort William was finished in 1773, and from that time Calcutta presents a smooth narrative of prosperity.

The Port has good accommodation for the largest vessels either at the Wet Docks or at the Jetties, which are amply furnished with hydraulic cranes for working cargo, and with all appliances for rapid despatch.

There are altogether eight jetties, and both docks and jetties are connected with the several railways. Ships are transported in the harbour by Assistant Harbour Masters, who are servants of the Port Trust, and the deep sea pilots are under the control of the Port Officer, who is immediately under the Government of Bengal.

Twelve vessels can be accommodated with berths for working cargo in the Wet Docks at Kidderpore, and two in the Tidal Basin.

Harbour Masters' fees vary according to the work required of them, but transporting charges are 25 Rupees each way. Hauling in and out of moorings 16 Rupees for each operation.

Mooring hire ranges from $1\frac{1}{2}$ Rupees for small vessels under 200 tons to 15 Rupees for vessels of 3,000 tons and upwards.

Port Dues are 4 Annas a ton.

The Pilots will take vessels of any draft up and down the river, but the maximum draft may be taken as 27 feet.

Pilotage is paid according to the draft of the vessel. Vide revised scale.

The anchorage within the port for vessels about to move or in Quarantine is in Garden Reach, 1 to 3 miles below the Kidderpore Docks.

Beyond the port the anchorages for deeply laden vessels are as follows:—

| | |
|--------------------|------------------------------|
| Budge Budge | 12 miles below Fort William. |
| Fisherman's Point | 27 do. do. |
| Diamond Harbour | 43 do. do. |
| Kulpee | 50 do. do. |
| Jellingham Channel | 65 do. do. |
| Saugor Roads | 82 do. do. |

Vessels do not anchor seaward of Saugor, except in fine weather to wait for the tide or orders. As a general rule the bottom at all the river anchorages is good holding ground.

There is sufficient water for vessels of any draft at the moorings, where all ships have to moor head and stern with 2 bower and 2 stern cables, shackled to the permanent moorings laid down parallel with the bank, the vessels lying in tiers of from 2 to 6.

There is no scale of fees for towage, as a written agreement is always drawn up.

The mean range of highest ordinary spring tides is 11·7 feet, and the highest high-water and the lowest low-water observed are respectively 24·1 feet and 2·2 feet above the datum of soundings in the river charts.

The apparent time of high-water at the full and change of the moon (mean establishment of the port) is 2 hrs. 2 min.

The time-ball on the Port Office and on Fort William is dropped simultaneously at 1 hr. p.m. Calcutta mean time daily, corresponding

to 19 hrs. 6 min. 39·2 secs. Greenwich mean time. A ball is dropped at the same time at the time-ball tower at Kidderpore Docks.

The Principal Exports are Cotton, Rice, Tea, Wheat, Gram, Spices, Shellac, Opium, Indigo, Hides, Timber, Tobacco, Sugar, Dye-stuffs, Cutch, Jute, India Rubber, and Country Coal, amounting in value to Rs. 527,860,148.

The Principal Imports are Salt, Piecegoods, Iron, Coal, Cotton Yarn, Machinery, Hardware, Wines and Spirits, Petroleum, Stationery, Glassware, Metals, and Wearing Apparel, amounting in value to Rs. 356,964,610.

The number and tonnage of cargo boats in the port are :—

Class 1. No. 896 representing 25,624 tons.

Class 2. No. 3138 do. 41,857 do.

Total No. 4034. Total 67,481 tons.

The number of boatmen available is ample for the requirements of the port, and labour is abundant.

The cost of working cargo is from 2½ to 6 Annas a ton, according to the nature of the cargo.

The cost of Landing and Shipping per ton is 3½ to 4 Annas for general cargo, and 5 Annas for timber.

The Port Trust have the management and control of the Docks, Jetties, Petroleum Wharf and Depot at Budge Budge, Moyapore Gunpowder Magazine, River Survey, Light Ships, Lighthouses, Houses of Refuge, the berthing and movement of the Shipping in Port, and the granting of licenses to the river boats and lighter-men.

The Port Officer has the supervision of the Pilot Establishment, and is also Shipping Master, Registrar of Shipping and Wrecks, Detaining Officer, President of the Board of Examiners in Seamanship and Navigation, Inspector of Pilgrims under Act 14 of 1895, also Officer appointed under Act 10 of 1887 and Act 6 of 1891, etc., etc.

The Collector of Customs grants port-clearances to vessels, and the Preventive Service is under his control.

Filtered water is supplied to the shipping either by boats or by the hoses from the hydrants, and can be obtained by application to the Superintendent of Water Supply of Shipping, at the Police Office.

The charge is at the rate of 5 Rupees per thousand gallons.

Provisions and stores are plentiful and cheap, and are usually obtained through contractors.

Coals can be put on board at the rate of about 75 tons an hour.

There are seven private dry docks, varying in length from 234 feet to 600 feet overall, with a breadth from 63 feet to 96 feet, and depth from 23 feet to 31 feet, and an average depth on the sills at spring tides from 18 feet to 25 feet from June to October, and the remainder of the year from $14\frac{1}{2}$ feet to $20\frac{3}{4}$ feet.

In addition to these the Port Commissioners have a new dry dock at Kidderpore of the following dimensions :—

| | | |
|-------------------|---|-----------|
| Length on blocks | . | 533 feet. |
| Width at entrance | . | 70 feet. |
| Depth on sill | . | 25 feet. |

They have also a dry dock at Howrah for their own purposes, and it is principally used for the light ships and small vessels.

The Government of India have a dry dock at Kidderpore, which is used for Government vessels only.

There are also 4 patent slips to lift vessels of 450 to 900 tons.

Repairs of any kind can be executed.

There is no schedule of rates for docking, as a written agreement is always drawn up.

The health of the Port is good and is under the supervision of a Government Medical Officer. Ambulance cars with bearers are provided and stationed at suitable spots, for the conveyance of sick seamen requiring hospital treatment. Hospital dues are 9 pies per registered ton.

The weather is uncertain from the beginning of May to the end of November, and during the transition periods, April, May, October, November, cyclones of severe intensity sometimes occur.

Ballast is obtainable in abundance, and can be put alongside at five Rupees a ton.

Tugs are always in readiness, and cruise off the sand-heads, in the fine season, for inward-bound vessels.

All vessels from infected ports must wait at Garden Reach till they have been inspected by the Health Officer. Bills of health are granted free of charge. Port rules are furnished to all arrivals.

Preventive Officers board all vessels on arrival, and remain on board, and must be housed and fed by the ship.

Stores can be released on application, but all dutiable stores must be sealed up.

Manifests of cargo and stores, and a list of the ship's crew must be presented for entry at the Custom House, and exact weights and measures must be given.

There are Consular Offices for all nations, also Lloyd's Agent, Chamber of Commerce, Harbour Board, Banks, Hospital for Seamen, and good Sailor's Home. Railways to all parts of India. European Mail weekly, and telegraph to all parts of the world.

Landing and shipping charges on the jetties or at the docks are as follows :—

Landing Charges.

Charges by measurement.

Minimum charge, if under 3 cubic feet, per packet 2 Annas.

Maximum charge over 60 cubic feet, per packet Rs. 4.

There are special charges for other cargo.

| | | Rs. | As. | P. |
|---------|--------------------|-----|-----|----|
| Iron | per ton | 1 | 0 | 0 |
| Gunnies | per bale | 0 | 4 | 0 |
| Jute | „ | 0 | 2 | 0 |
| Seeds | per bag | 0 | 1 | 0 |
| Rice | „ | 0 | 1 | 0 |

On other cargo the charge is about one Rupee per ton of 20 cwt. or 40 cubic feet.

Charges by weight.

Minimum not exceeding 2 tons . . . per cwt. Rs. 0 1 6

Maximum on all goods exceeding 10 tons per cwt. „ 0 8 0

The rate for unloading into boats alongside is one-third of the landing charges.

Every ship unloading at the jetties will be charged 35 Rupees per day.

Charges for 30 ton floating crane :—

Minimum not exceeding 2 tons. . . per cwt. Rs. 0 1 6

For each lift exceeding 10 tons . . „ „ 0 8 0

Shipping Charges.

By measurement.

Minimum, if under 3 cubic feet, per package . Rs. 0 1 0

Maximum, over 50 cubic feet, per package . „ 2 8 0

By weight.

Minimum under 2 tons . . . per cwt. Rs. 0 1 6

Maximum on all weights over 8 tons . „ „ 0 7 0

All other cargo on the basis of 1 Rupee per ton of 40 cubic feet or 20 cwt.

The river Hoogley, from the Eastern Channel Light-vessel to Calcutta, must be considered as strictly pilotage waters, and no description of its channel can be of any use for any length of time as they are continually changing. Vast quantities of silt, forming banks and quicksands, are continually being deposited, and the channels have to be watched and sounded constantly and some of them daily.

The state of the channels is signalled to the pilots daily from the Bank in the most important places.

Plans of the most dangerous parts and new channels or siltings are printed and circulated amongst the pilots.

It is the most dangerous river in the world. The chief difficulty to navigation is 30 miles below Calcutta at the junction of the Hoogley and Roopnarian Rivers, where many fine vessels have been lost.

No river is more carefully conserved. The work is under the charge of Captain Petley, R.N., and his subordinates are continually on the river surveying.

It is high water, full and change, at Eastern Channel Light-vessel at 8 hours, 43 minutes.

The least depth in the fair way of Gaspar Channel is 16 to 17 feet at low water, on a bar formed between Middleton Sand and Lower Long Sand.

Great changes have taken place in the sands at the entrance of the Hoogley, and the charts of the locality cannot be depended upon.

The buoyage of the Hoogley is in accordance with the uniform system of buoyage adopted in India.

That is, entering from seaward:

Starboard-hand buoys are red surmounted by a black staff and triangle.

Port-hand buoys are black surmounted by a black staff and cylinders.

Fairway buoys are black and white in horizontal stripes.

STORM SIGNALS are hoisted at the following flag-staves:—near the Lighthouse on Saugor Island, near the telegraph office at Mud Point, and near the telegraph office, Diamond Harbour; also in

the port of Calcutta—at the flagstaff upon the Port Commissioner's office; on a flagstaff at Shalimar Point, Sibpur, and on a flagstaff at Budge-Budge telegraph office—on receipt of instructions telegraphed by the meteorological reporter to the Bengal Government.

A severe cyclonic storm is frequently accompanied by a storm wave, which is not often the case with a small cyclonic storm.

Two balls placed vertically. This signal indicates the existence of disturbed weather in the northern part of the Bay of Bengal. The disturbed conditions may consist of squally weather with strong winds to the south, which may shortly pass away, or which may be the first stage of a cyclonic storm, in which case the signal will be replaced by one of the following:—

Day signal, No. 0, precautionary.



A ball indicates the existence of a cyclonic storm of undetermined intensity and magnitude in the Bay of Bengal, which will certainly either cross the coast southward of a line between Chittagong and False Point, or approach the Bengal coast, but which is as yet too distant to enable its track to be determined.

Day signal, No. 1, preparatory.



A cone indicates the early probable passage northwards, to the eastward of Saugor Island and westward of Chittagong, of the vortex of a cyclonic storm of great intensity and magnitude. No sailing vessels, nor deep-laden, nor slow steaming steam-vessels should go to sea. The wind at the mouth of the Húgli will probably shift from north-east to north, north-west, &c.

Day signal, No. 2, danger.



An inverted cone indicates the early probable passage northwards, to the westward of Saugor Island and northward of False Point, of the vortex of a cyclonic storm of great intensity and magnitude. No vessels should go to sea, and pilots of outward bound vessels should be guided by the appearance of the weather and the height of the barometer in deciding whether to proceed below Diamond Harbour or Mud Point. The wind at the mouth of the Húgli will probably veer from north-east, to east, south-east, &c.

Day signal, No. 3, danger.



Day signal No. 4, great danger



A drum indicates the approach of a cyclonic storm of great intensity and magnitude to the mouth of the Húgli, and which will probably advance to Calcutta. No vessels should go to sea from Saugor Island, or proceed down from Diamond Harbour; and all vessels should be properly secured.

The masters of vessels in port should take the special precautions for safety laid down in the port rules.

There will probably be a storm wave, but its height and destructive effect depend quite as much on the state and character of the tide when the cyclonic centre reaches the coast, as upon the depression at the centre, or the intensity and extent of the storm.

Day signal, No. 5, bad weather.



Two cones, the upper one inverted, indicate the existence of a cyclonic storm of small extent in the Bay of Bengal, which will probably reach and cross the shore of the bay southward of a line joining Chittagong and False Point.

Day signal, No. 6, warning.



Two cones, the lower one inverted, indicate the existence of a cyclonic storm of small extent, which will probably reach and cross the shore of the bay, northward of a line joining Chittagong and False Point, but the path of the vortex cannot be determined.

Day signal, No. 7, warning.



A ball below a cone indicates the probable passage northwards, to the eastward of Saugor Island and westward of Chittagong, of a cyclonic storm of small extent and intensity, of the kind which usually forms in the rainy season. Vessels may proceed to sea if barometer, state of sea, and weather are such as to lead masters and pilots to infer that there is no danger. The wind at the mouth of the Húgli will probably shift from north-east to north, north-west, etc.

Day signal, No. 8, warning.



A ball below an inverted cone indicates the probable passage northwards, to the westward of Saugor Island and northward of False Point, of a cyclonic storm of small extent and intensity, of the kind which usually forms in the rainy season. The wind at the mouth of the Húgli will probably veer from north-east to east.

south-east, etc. These easterly winds produce a heavy swell and strong westerly set in the channel at the Sandheads; none but fast steamers in light trim should put to sea, and those only if the weather appearances and state of the sea, etc., permit.

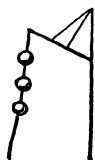
Day signal, No. 9, danger.



A ball below a drum indicates the approach towards Saugor roads of a cyclonic vortex of small extent, of the kind which forms during the rainy season. It is advisable that no vessels except fast steamers in light trim should put to sea, until the direction and force of the wind, the state of weather and sea, and the rise of the barometer indicate that the storm has either broken up or passed inland. Cyclonic storms of small extent sometimes blow with extreme force and raise a high sea near their centres.

At night.—The following signals are exhibited at the signal stations previously mentioned between sunset and sunrise :—

Night signal, No. 1, warning or caution.



Three lights placed vertically indicate the existence of a cyclonic storm in the northern part of the Bay of Bengal.

Night signal, No. 2, danger.



Two lights placed vertically indicate the early approach of a cyclonic storm to the Bengal coast, or to the port of Calcutta if the signal is exhibited there.

Hoogley River Approaches.

Floating Light-Vessels. All bearings are magnetic.

Long Sand.

Lat. $21^{\circ} 36' 20''$ N., Long. $87^{\circ} 59' 30''$ E.

Is stationed in Saugor roads with Saugor Lighthouse bearing *N.E.* distance $3\frac{1}{2}$ miles, and the Long Sand spit buoy *S. 75° W.* distance $\frac{1}{10}$ of a mile in 22 feet of water.

Day.—Carries a small black ball over a larger one, the hull painted red, and “Long Sand” painted in white letters on her side.

Night.—Displays a fixed white light 21 feet above the water, visible in clear weather 9 miles, and a riding light 6 feet above the rail.

Upper Gaspar.

Lat. $21^{\circ} 31' 0''$ N., Long. $88^{\circ} 2' 2''$ E.

Is stationed in the Gaspar Channel in 20 feet of water, with Saugor Lighthouse bearing N. $\frac{1}{4}$ W., distance $7\frac{1}{2}$ miles and centre Eastern Gaspar buoy east $2\frac{1}{4}$ miles.

Day.—Carries a black drum at main mast-head, the hull painted red, and name of station painted in white letters on the side.

Night.—Displays a fixed white light 48 feet above the water, visible in clear weather 12 miles, also carries a riding light on the forestay 6 feet above the rail.

During fogs fires a gun every first and third quarter of the hour.

Lower Gaspar.

Lat. $21^{\circ} 25' 53''$ N., Long. $88^{\circ} 7' 0''$ E.

Is stationed in the Gaspar Channel in 28 feet of water with station buoy S. 70° W., distance 0.7 mile, Upper Saugor sand buoy S. 66° E., distance 2 miles.

Day.—Carries a black cone at main mast-head, the hull painted red, and name of station painted in white letters on the side.

Night.—Displays a group flashing white light with a period of one minute; flash 10 secs.; eclipse 10 secs.; flash 10 secs.; eclipse 30 secs., 48 feet above the water, visible in clear weather 12 miles, carries a riding light on the forestay 6 feet above the rail, also burns a blue light at the half hour.

During the time the intermediate light vessel is not on her station (*i.e.*, from 1st December to 31st January) this lightship will from sunset to sunrise burn a blue light at the hour in addition to the one burnt at the half hour. During fogs fires a gun at the hour and half hour.

The two Gaspar Lights now bear from each other $\frac{N}{S} 46^{\circ} \frac{W}{E}$, distance 6.9 miles.

Intermediate.

Lat. $21^{\circ} 13' 45''$ N., Long. $88^{\circ} 11' 0''$ E.

Placed in position from the 1st February to 30th November (inclusive).

Is stationed about half-way between the Lower Gaspar and Eastern Channel Light-Vessels in 42 feet of water with the Wreck buoy north, distance $\frac{3}{4}$ of a mile, Bell buoy N. 40° W., distance $5\frac{1}{2}$ miles, and Centre Saugor sand buoy north, distance 5 miles.

Day.—Carries a black half-ball at the main mast-head with the spherical side downwards, the hull painted red, and name of station painted in white letters on the side.

Night.—Displays a fixed white light 48 feet above the water visible in clear weather 12 miles; also carries a riding light on the forestay 6 feet above the rail.

Eastern Channel.

Lat. $21^{\circ} 0' 30''$ N., Long. $88^{\circ} 12' 0''$ E.

Is stationed at entrance to Eastern Channel in 60 feet of water, with station buoy N., distance $1\frac{1}{2}$ miles, and lower reef buoy N. 40° W., distance $6\frac{1}{2}$ miles.

Day.—Carries a black ball at main, the hull painted red, and name of the station painted in white letters on the side.

Night.—Displays a single flashing white light in periods of thirty seconds, the duration of each flash being about five seconds, and the dark interval about twenty-five seconds.

Visible in clear weather 12 miles, also carries a riding light on the forestay 6 feet above the rail.

During the south-west monsoon, or from 15th March to 31st October, a blue light will be burnt every half-hour between 7 P.M. and 5 A.M. In the north-east monsoon, or from 1st November to 14th March, a blue light will be burnt every hour between 7 A.M. and 5 A.M.

Pilots' Ridge.

Lat. $20^{\circ} 51' 30''$ N., Long. $87^{\circ} 52' 0''$ E.

Is stationed just eastward of the Pilots' Ridge in $26\frac{1}{2}$ fathoms of water, with the station buoy bearing N., distance 1 mile.

Day.—Carries a black ball and half-ball at the main masthead, the hull painted red, and name of station painted in white letters on her side.

Night.—Displays a single flashing white light in periods of sixty seconds, the duration of each flash being about ten seconds, and of the dark interval fifty seconds.

Visible in clear weather 12 miles, and also carries a riding light on the forestay 6 feet above the rail.

A blue light will be burnt every hour between 7 P.M. and 5 A.M. from 15th March to 31st October inclusive.

Mutlah.

Lat. $20^{\circ} 57' 0''$ N., Long. $88^{\circ} 34' 0''$ E.

Is stationed off entrance to Mutlah river, in 17 fathoms, mud bottom, and with the station buoy bearing N., distance 1 mile.

Day.—Carries a black half-ball surmounted by a black cone on the main mast-head, the hull painted red, and name of station painted in white letters on side.

Night.—Displays a double flashing white light in periods of thirty seconds, the duration of each of the two flashes being about two and a half seconds; of the intermediate eclipse, about two and a half seconds, and of the long eclipse, about twenty-two and a half seconds.

Visible in clear weather 12 miles, also carries a riding light on the forestay 6 feet above the rail.

Note.—Light-vessels out of position at night show a fixed red light at bow and stern, a red flare every quarter of an hour, and the station light put out. If in danger, fire rockets by day, distinguishing mark struck.

All light-vessels during fogs will ring a bell at not more than two minutes' interval.

Lighthouses.*Cowcolly Lighthouse.*

Lat. $21^{\circ} 50' 10''$ N., Long. $87^{\circ} 56' 9''$ E.

Is situated close to the Hidgelee river, about 2.4 miles S. 49° W. of Kedgerie Tidal Semaphore, and about 7 cables inshore.

It is a fixed white light illuminating an arc of 56° , viz., between N. by W. round to W.N.W.; the lantern is 62 feet above high water, and the light is visible in clear weather from 10 to 12 miles. The reflection of this light is visible all round from seaward, and is so arranged for the convenience of small vessels anchoring in the channels.

The Lighthouse is built of brick and painted white. This light was first exhibited in 1810.

Kalpi Anchorage Light.

Lat. $22^{\circ} 6' 0''$ N., Long. $88^{\circ} 11' 15''$ E.

Is situated close to the surveying beacon, about $\frac{1}{2}$ of a mile eastward of Jigerkolli Obelisk. It is a fixed white light, visible

1



from *N.* through *W.* to *S.S.W.*, elevated 12 feet, and visible 5 miles in clear weather.

Kantabaria Light.

Lat. $22^{\circ} 8' 0''$ *N.*, Long. $88^{\circ} 12' 40''$ *E.*

Is a fixed red light, elevated 16 feet above high water, and is visible in clear weather 5 miles.

It is exhibited either from Kantabaria Obelisk or a mast alongside it.

Diamond Harbour Lights.

Lat. $22^{\circ} 11' 30''$ *N.*, Long. $88^{\circ} 11' 0''$ *E.*

They are 2 fixed red lights, elevated 14 feet above high water, and visible 2 to 3 miles in clear weather. One is shown from the yard-arm of the Telegraph Office, and the other from abreast the Custom House trees.

Fisherman's Point Light.

Lat. $22^{\circ} 19' 40''$ *N.*, Long. $88^{\circ} 5' 30''$ *E.*

Is a fixed red light, elevated 14 feet above high water, and visible 2 to 3 miles in clear weather, and is exhibited from the western bank of the river abreast Fisherman's anchorage.

Saugor Lighthouse.

Lat. $21^{\circ} 38' 40''$ *N.*, Long. $88^{\circ} 2' 0''$ *E.*

Is situated about $\frac{1}{2}$ a mile *N.E.* of Middleton Point, Saugor Island.

It is a fixed and flashing white light, illuminating an arc of 225° , viz., from *N.W.* through *N.* and *E.* to *S.*, the interval of revolution or flash being 20 seconds, and the light is visible in clear weather 15 miles.

The lighthouse is built of twelve iron cylinders, and is painted in alternate red and white horizontal bands; the lantern is a common argand, and stands 74 feet above high water.

The light was first exhibited in 1821, but the present light was exhibited in 1852.

Note.—Vessels can telegraph from Saugor to Calcutta.

Instructions to wrecked seamen and others who may reach a Refuge-House in distress.

Owing to these houses being looted continually from the time of their erection in 1851, the Port Commissioners, with the approval of the Government of Bengal, have decided to supply these houses with water only.

If journeying from one Refuge - House to another, the party should be kept together, and no one allowed to stray, as tigers are numerous.

Make a fire as a signal of distress with the drift wood generally to be found all along the seaface and banks of the rivers.

After cyclones and heavy gales a steamer is despatched to visit the Refuge-Houses ; therefore, under such circumstances, unless you have boats, it will be advisable to remain by the Refuge until assistance arrives ; but in cases where vessels have been lost in ordinary weather of either monsoons, it will be advisable to send notice to Mud Point, Saugor Island, or Port Canning, or to vessels entering the river (as may seem best), by the punt with which each house is provided, if no better mode of conveyance is at hand. The chart will indicate the route to be observed.

Should you decide to leave the house, keep together, and follow as much as possible the large creeks or sea-beach, going from one house to another, if necessary, until you come to Channel Creek (if going to the westward) where there are villages on Saugor Island. To the eastward, villages will be found above the Cattalee on the river Mutlah, if you decide on proceeding to Canning Town.

On your road, break the branches of trees (allowing them to hang), to indicate to those who may be in search of you, the direction you are going in. If travelling to the north, break the branches on the north side of the trees ; if to the west, those on the west side, etc. Be careful to do this at all points, and at the entrance of creeks that you may pass. Carry fire with you ; it will be useful in many ways, and enable you to make signal-fires at all stopping-places as you go along.

The rope placed amongst the stores is intended to assist in making a raft or for tracking purposes. Drift wood in large quantities is often found, and among it may sometimes be found material for forming a raft, if required.

The hearts of the young palm trees, which grow in great numbers, will be found edible. The scurvy grass or samphire, which grows in great quantities, is also edible when cooked. An oyster-bed exists in the creek on the opposite bank of the river to that on which No. 4 Refuge-House is situated, but search must be made for the oysters at low water. They are to be found sticking out of the mud in the bed of the creek. They are somewhat coarse flavoured, but very nutritious, and though oysters have only been actually met with in this one creek, there is not the slightest doubt but that they are to be found in many others. Water can be procured at No. 1 House by digging down a few feet on the higher parts of the land, and there is every probability of water being found in many parts of the Soonderbunds at short distances from the sea, particularly on the higher lands, such as the west sides of Bulcherry and Bagandoony Islands, etc., etc. A shoot has been attached to the roof of the house for the purpose of catching water, and the hose supplied among the stores is intended to enable you to save water when it rains, and refill the tank before leaving the house.

Notes for Captains of Vessels arriving at the Sandheads.

Note.—No dependence can be placed in finding two brigs on the station.

Distinguishing signals used by the Pilot Brigs. A red flag hoisted at the main is intended to inform Captains of inward-bound vessels that she will supply him with a pilot, and should be made for without hesitation, irrespective of the other brig.

At night the Supply Brig endeavours to attract the attention of inward-bound vessels by burning maroons at short intervals between the Admiralty 15 minute Regulation.

The Buoy Brig, *i.e.*, the brig that takes out the pilot from outward-bound vessels, hoists a white flag at the fore.

Should the Captain of an inward-bound vessel on arrival at the Sandheads find neither of the Pilot Brigs with the red flag flying at the main, he may conclude that there are no pilots on the station. He should pay particular attention to any signals that may be made to him.

The Captains of inward-bound steam-vessels should, when within signal-distance, indicate her gross tonnage to the Commander of the

Pilot Brig, as he cannot supply them with a pilot until this information has been given. Sailing vessels should show net tonnage.

Steamers on closing the Pilot Brig should "lay to" under her stern or weather quarter, and, after the pilot is on board, tow the boat to windward of the Brig.

Sailing vessels should invariably "lay to" on the same tack as the Pilot Brig, unless signalled to the contrary.

Cruising station of Pilot Brigs.—During the south-west monsoon they endeavour to cruise 7 to 8 miles S. to S.W. of the Eastern Channel Light-Vessel, the Supply Brig, as a rule, taking the outer position.

During the north-east monsoon they cruise or anchor 4 to 5 miles from West to N.N.W. of the same Light-Vessel.

Vessels arriving at the Sandheads and finding the Supply Pilot Brig at anchor, should use the utmost caution in closing her on account of the strong tides.

When easterly winds prevail, there is a strong set to the westward; it is then specially incumbent on strangers to take advice given from the Brig.

Vessels coming in at night should never heave-to to windward if they intend to take a pilot before day-light, but close with the Brig as soon as possible.

The Brig should be approached round the stern, whether at anchor or under way.

In the months of August, September, and October, when vessels are signalled to keep to windward, from there being no pilots or other causes, they should be careful to keep the *F.L.* vessels or brigs well in sight, for should the wind fall light, they are liable to be set out to sea, and, particularly in the two latter months, may not be able to return for many days. This requires their particular attention.

The *Lead* should be used frequently after getting on soundings.

Signals from the brig "to prepare for bad weather," should not be ignored.

Strangers working in should study the tide; the first of the flood setting to the Westward, stand to the Eastward; the first of the ebb setting to the Eastward, stand to the Westward and Northward.

A kedge anchor is useful in light winds and calms, when on soundings.



HUGLI PILOT BRIG.

Strangers anchoring below the Lightship, or at a distance off her or the Brigs, should endeavour to get to the latter, and not remain at anchor.

This applies to both monsoons. The practice of sailing-vessels rounding the Brig close to with much way on, in a sea-way, is dangerous, both to the latter and the boat alongside.

It almost swamps the boat, and the ship, on being brought to the wind, gets a rapid stern board on the Brig, which has often great difficulty in getting clear.

There is an understanding between the pilots and the British India Captains that when one of the latter arrives at the Sandheads at night and wants a pilot, she can indicate, by blasts of her whistle, her gross tonnage and thus the rank of pilot required, as follows:—

| | |
|---|----------|
| Branch Pilot, up to any tonnage | 1 blast |
| Senior Master, up to 2,800 tons | 2 blasts |
| Junior Master, up to 2,200 tons | 3 „ |
| Mate Pilot, up to 1,600 tons | 4 „ |

This arrangement is very useful at night, as it obviates approaching the brig within hailing distance, and also saves much time.

There is no apparent reason why all steamers, wanting pilots at night, should not use the signals.

| DRAUGHT. | Full pilotage outward. | INTERMEDIATE OF BROKEN PILOTAGE. | | | | | | | | | | |
|---------------------------|------------------------------|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Not exceeding 8 feet..... | 54 | 5 | 9 | 14 | 18 | 23 | 27 | 31 | 36 | 40 | 45 | 49 |
| 8 feet and not exceeding | 85 | 8 | 15 | 22 | 29 | 36 | 43 | 50 | 57 | 64 | 71 | 78 |
| 9 do. | 128 | 11 | 22 | 33 | 43 | 54 | 64 | 75 | 85 | 96 | 107 | 117 |
| 10 do. | 149 | 13 | 25 | 37 | 50 | 62 | 74 | 87 | 99 | 111 | 124 | 136 |
| 11 do. | 170 | 15 | 29 | 43 | 57 | 71 | 85 | 100 | 114 | 128 | 142 | 154 |
| 12 do. | 192 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 |
| 13 do. | 224 | 19 | 38 | 56 | 75 | 93 | 112 | 131 | 149 | 168 | 186 | 204 |
| 14 do. | 255 | 22 | 43 | 64 | 85 | 107 | 128 | 149 | 170 | 192 | 213 | 234 |
| 15 do. | 309 | 26 | 52 | 78 | 103 | 129 | 155 | 180 | 206 | 232 | 257 | 283 |
| 16 do. | 383 | 32 | 64 | 96 | 128 | 160 | 192 | 224 | 255 | 287 | 319 | 351 |
| 17 do. | 447 | 38 | 75 | 112 | 149 | 186 | 224 | 261 | 298 | 335 | 372 | 410 |
| 18 do. | 500 | 42 | 84 | 125 | 167 | 200 | 250 | 292 | 333 | 375 | 417 | 458 |
| 19 do. | 574 | 48 | 96 | 144 | 192 | 240 | 287 | 335 | 383 | 431 | 479 | 526 |
| 20 do. | 638 | 54 | 107 | 160 | 213 | 266 | 319 | 372 | 425 | 479 | 532 | 585 |
| 21 do. | 691 | 58 | 116 | 173 | 231 | 288 | 346 | 403 | 461 | 518 | 570 | 634 |
| 22 do. | 744 | 62 | 124 | 186 | 248 | 310 | 372 | 434 | 496 | 558 | 620 | 682 |
| 23 do. | 819 | 69 | 137 | 205 | 273 | 341 | 410 | 478 | 546 | 614 | 682 | 750 |
| 24 do. | 955 | 78 | 156 | 234 | 312 | 390 | 468 | 546 | 624 | 702 | 780 | 858 |
| 25 do. | 1,102 | 92 | 184 | 276 | 368 | 459 | 551 | 642 | 733 | 825 | 917 | 1,009 |
| 26 do. | 1,275 | 107 | 213 | 319 | 425 | 532 | 638 | 744 | 850 | 957 | 1,063 | 1,169 |

Rules for the Port of Calcutta.

1. In these Rules the word "Commissioners" shall be understood to mean "The Commissioners of the Port of Calcutta" as constituted by Act III (B.C.) of 1890.

2. In these Rules the words "Howrah Bridge" shall be understood to mean the bridge constructed and maintained under the provisions of Act IX (B.C.) of 1871.

3. In these Rules the word "daybreak" shall be held to mean half an hour before sunrise, and the word "dark" to mean half an hour after sunset.

4. No vessel of the burthen of 200 tons or upwards coming into the Port shall proceed above the house of the Superintendent of the Government Botanical Gardens (hereinafter called Garden House), or move from one place to another within the Port above Garden House between dark and daybreak, without the special permission of the Commissioners, provided that a vessel which has arrived above Garden House before dark may at once proceed to a safe anchorage at any part of the Port between Tolly's Nala and Prinsep's Ghât.

5. Steam-tugs having no vessel in tow shall be permitted to enter the Port after dark at their own risk, but they shall not proceed above Chandpal Ghât. Steam-tugs shall be held liable for any damage which they may cause by moving at night. 14057

6. No vessel of the burthen of 200 tons or upwards shall steam, sail, or be towed up on the flood or down on the ebb, within the Port, above Garden House, without the special permission of the Commissioners; and in such cases where such permission is granted, the officers in charge shall be held strictly responsible for accidents which may occur in consequence of their taking the vessels up or down at a greater speed than is absolutely necessary in order to keep them under command; and in every case where such permission is granted the speed of the vessels shall not exceed four miles an hour through the water. A vessel arriving off Garden House on the last quarter of the flood, and bound for the Kidderpore Docks, will be allowed to steam up until opposite the entrance of the Docks.*

7. No vessel shall steam, sail, or be towed up on the ebb or down on the flood within the Port above Garden House, at a speed greater than four miles an hour over the ground.

8. Vessels may at all times drop up or down the Port above Garden House with their anchors on the ground. Vessels using their own steam-power when dropping with the tide shall in no case proceed at a greater speed than is absolutely necessary in order to keep them under command.

9. All vessels anchored or moored in the stream within the Port shall exhibit, between dark and daybreak, where it can best be seen, but at a height not exceeding 20 feet above the hull of the vessel, a white light in a globular lantern of eight inches in diameter, and so constructed as to show a clear, uniform, and unbroken light visible all round the horizon and at a distance of at least one mile. Vessels under weigh at night shall show the lights prescribed by the Board of Trade's Regulations, with the exception of cargo boats, bhurs, budgerows, up-country and passenger row-boats, which shall carry such lights as shall from time to time be prescribed at the time of licensing.

* With reference to Port Rule No. 6, the following instruction for the guidance of Assistant Harbour Masters is published for general information:—

"Assistant Harbour Masters are forbidden, without a special order from the Harbour Master's Office, to turn outward-bound vessels until they are below the Lower College Sand Buoy.

10. A free channel of not less than 200 yards in width shall be kept for vessels, moving up or down the river in the Port, and also free passages to piers, jetties, landing-places, wharves, quays, docks and moorings; and all vessels shall move when ordered to clear such channel or passages.

11. The river between the lower buoy of the College Sand and Metteabrooj Ghât shall be kept clear for turning inward or outward bound vessels, and no vessels shall anchor within these limits. Between the College Sand and Tolly's Nala vessels cannot anchor without infringing the preceding rule. All vessels intending to anchor in Garden Reach shall be moored below Metteabrooj Ghât moorings, in a clear swinging berth, as close to the south bank as the length and draught of the vessels will admit. Inward-bound vessels proceeding above Metteabrooj Ghât shall moor in the stream between Prinsep's Ghât and Tolly's Nala, leaving the clear channel of 200 yards described by the preceding rule.

12. Vessels entering the port at neap tides during the freshets are permitted to proceed above Garden House at slack-water at a speed not exceeding four miles an hour over the ground.

13. River steamers and tug steamers having no vessels in tow are permitted to move up on the flood or down on the ebb at their own risk, and at a speed sufficient to keep them under command, but in no case shall the speed within the Port above Garden House exceed four miles an hour through the water.

14. No steam vessel shall proceed at a greater rate of speed than four miles an hour through the water when inside the moorings, and no such steam vessel shall proceed at a greater rate of speed than four miles an hour through the water anywhere within the Port above Garden House after dark. Without the special permission of the Commissioners, no steamers carrying passengers shall be under weigh after dark between the limits of the landing stage at Hastings on the south and Aheeretolah on the north.

15. Special permission may be given by the Commissioners to ferry steamers to move in the Port, otherwise than is prescribed in these rules, due limitation being laid down as to place and hours of plying and speed in each case.

16. Inland steamers and flats lying above the Howrah Bridge shall not haul out of moorings during the freshets on the last quarter of the ebb.

17. All vessels within the Port shall take up such berths as may be appointed for them by the Commissioners or the Harbour Master, and shall move from one berth to another when ordered to do so; but this rule shall not apply to vessels when moving within the Port between Budge-Budge and Garden House in charge of a pilot.

18. No vessel shall make fast to, or use any of the moorings, whether fixed or swinging, without the permission of the Commissioners.

19. All applications to be hauled into or cast off from the moorings, or for any other assistance, shall be made, either personally or by letter, to the Harbour Master. Applications will, as far as possible, be complied with in order according to date of receipt.

20. After a vessel is moored she shall not be moved without the permission of the Harbour Master.

21. All vessels lying at swinging moorings shall, during the freshets (5th June to 31st October), in addition to their bower chain have the end of a good hawser also fast to the ring of the moorings.

22. All vessels moored in the stream shall keep a clear hawse.

23. Vessels lying in the stream, or at the moorings, shall at all times have at least one anchor at the bow, with a cable bent and ranged ready to let go. In cases where

the vessel has no spare hawse pipe, the towing hawser is to be bent on over all in lieu of the chain cable.

24. No vessel shall lie at single anchor in the Port unless a Pilot or Assistant Harbour Master is on board.

25. All vessels placed in the moorings on the ebb tide shall during the spring tides, when bores are expected, have their best hawsers passed from each quarter pipe abaft the main mast, and made fast to the stern moorings, if possible; otherwise to their own chains close to the moorings, and hove taunt with sufficient strain to relieve the jerk on the chains and bitts when the bore comes up.

26. Steam-vessels occupying moorings shall not turn their screws or paddles without giving sufficient warning of their intention to do so to boats in the vicinity; they shall not put full power on when trying their engines in the moorings, nor shall any trial under steam be permitted so long as a vessel is lying at the jetties.

27. No vessel within the Port above Garden House shall have any anchor or spar, or other substance likely to cause damage, projecting from her side.

28. All vessels on arrival in the Port shall rig in their jib and driver booms, and shall keep them so rigged in until the pilot takes charge of the vessel for the purpose of taking her to sea. They shall also strike their yards and masts when ordered by the Commissioners. Vessels proceeding to the jetties shall, when so required by the Assistant Harbour Master in charge, remove all boats and all other projections likely to damage the jetties and cranes.

29. From the 1st day of May until the 30th day of June, and from the 1st day of October to the 15th day of November, all sailing vessels in Port shall have their royal and top-gallant yards on deck, and mast-ropes rove in readiness to send the top-gallant masts down at short notice if required. Vessels about to leave the Port may send their top-gallant yards aloft 48 hours before leaving the moorings. Vessels entering the Port between the above dates, having top-gallant masts and yards aloft, may be placed in moorings, and the top-gallant yards of such vessels shall be sent down within 24 hours after they are moored.

30. On the occurrence of signs of an approaching cyclone, a black drum will be hoisted during daylight from the flagstaff on the roof of the Commissioners' Office, Kolia Ghât, another from the flagstaff opposite the Government Dockyard, Kidderpore, and another at the Petroleum Wharf at Budge-Budge. During the night, under similar circumstances, two bright lights in a vertical line will be exhibited from the same flag-staffs. When these signals are displayed, Masters of vessels shall immediately take every precaution in their power to make their vessels snug and secure, by having awnings furled, and the lower and top-sail yards counter-braced or pointed to the wind as seems best. The cables shall be bent to both bower anchors when possible.

31. Vessels arriving in Port with coal or other cargo likely to cause nuisance shall not moor above Garden Reach moorings without the permission of the Commissioners.

32. Vessels referred to in Rule 31 shall discharge their cargo from whichever side the Harbour Master may direct, and shall adopt such measures as he may order for the abatement of the nuisance arising from the discharge.

33. With the exceptions hereinafter noted, no vessel of or exceeding 200 tons burthen shall, without the special sanction of the Commissioners, move up or down the Port through the ship opening of the Howrah Bridge, except such vessel is propelled or towed by steam against the tide, and then only at such rate of speed, not exceeding four miles an hour over the ground, as is absolutely necessary to keep good steerage way. No river steamer shall pass through the opening with more than two vessels in tow.

Exceptions.—Tug and river steamers, when not towing or propelling other vessels, may drop through the bridge opening, under steam, head to tide.

River flats may be dropped or warped at slack-water through the ship opening or through the 60-foot openings.

34. No steam-vessel shall attempt to pass any other vessel proceeding in the same direction whilst between the pontoons of the Howrah Bridge.

35. No steam-vessel shall have in tow more than two cargo-boats when proceeding through the bridge opening with the tide.

36. No inland steam-vessel, the beam of which exceeds 30 feet, or when, towing flats or boats abreast, her beam added to that of the tow exceeds 30 feet, shall when moving up or down the Port, proceed through the 60-foot openings of the Howrah Bridge, unless such vessel is propelled or towed by steam against the tide.

37. No steam-vessel shall pass through the bridge opening without first sounding its whistle.

38. All vessels about to leave the Port shall hoist the Blue Peter at the fore at 6 A.M. on the day previous to that on which they leave the moorings, and shall keep it hoisted until the Pilot takes charge of the vessel to take her to sea.

39. No person shall smoke or use naked lights of any description in the hold or between-decks, or in any enclosed space on the upper deck in which stores, cargo, or inflammable materials are stored, or any vessel within the Port or in any dock belonging to the Commissioners within the Port.

40. Fire shall be permitted only in galleys or fireplaces regularly constructed for the purpose: such fires to be kept alight only between daybreak and 9 P.M. Cooking fires shall not be allowed on board vessels in dry dock.

41. With a view to the extinction of fires, all vessels in Port shall be provided with three buckets for every hundred tons of registered measurement up to 600 tons, and two additional buckets for every 100 tons above 600: provided that the total number of buckets shall not be required to exceed 50 in any vessel. One-half of the number of such buckets shall be left constantly hanging up on the quarter-deck or other convenient place.

42. For the better security of vessels against damage or loss by fire, a steam floating fire engine has been provided, and is always kept under steam, ready to proceed at once to any place where her services may be required. The fire Engine Station is at Fort Point, where the vessel is moored, and where a lookout is kept day and night. In case fire breaks out on board a vessel, notice should at once be sent to the Fire Engine Station. When fire has broken out in any vessel the officers in charge of all vessels in neighbouring moorings or anchorage shall furl their awnings; get their force-pumps ready for use, and prepare for slipping their cables and chains, seeing specially that the pins of the shackles can be immediately knocked out.

43. All vessels in Port shall adopt sufficient precautions and guards to prevent injury to persons or goods through the discharge of steam from any part of the vessel.

44. When cargo is being loaded into, or unloaded from, any ship through any hatchway, every hatch, fore and after, and crossing shall be either removed from it or slung separately by a lanyard of sufficient strength to prevent its falling into the hold.

45. Masters of vessels requiring work to be performed in bilges, boilers, and double bottoms shall take precautions to ensure that working in such places is free from all danger before the men are sent into them.

46. No boats are to go alongside of any vessel for the purpose of embarking or disembarking passengers until the vessel is reported to be moored and the engines finished with. The Port Police will satisfy themselves that such is the case before the boats are allowed alongside.

This rule is not to apply to a boat carrying the agent or other person having business with the vessel.

47. No Master or Officer for the time being in charge of or doing duty on board any vessel shall, on and from the 1st day of April to the 31st day of October inclusive, employ, or cause to be employed, any European seaman or apprentice in cleaning or painting between the hours of 9 A.M. and 4 P.M. necessitating the direct exposure of such seaman or apprentice to the rays of the sun.

48. No vessels of more than ten tons burden shall, without such license as herein-after is mentioned, be afloat within the Port without having on board thereof a crew of not less than the number set forth in the first schedule hereto.

49. Whenever it shall appear to the Commissioners that any vessel may, without danger to other vessels, be afloat without such crew as is set forth in the first schedule hereto being maintained thereon, it shall be lawful to the Commissioners, if they shall think fit, to grant under their hand a license in the Form A in the second schedule hereto, which license may be made determinable on the breach of any conditions therein contained; and during the continuance of such license the provisions of Rule 48 shall not apply to such vessel.

50. It shall be lawful for the Commissioners by any writing under their hand, in the Form B in the second schedule hereto, to revoke such license; and from and after the publication of such revocation, by posting a copy thereof upon some conspicuous part of such vessel, the provisions of Rule 48 shall apply to such vessel as if no such license had ever been granted.

51. Whenever it shall appear to the Commissioners that any creek, river, or dock is so situated that vessels without any crew therein may remain afloat in such creek, river, or dock, without danger to any vessels in any part of the Port, it shall be lawful for the Commissioners to make an order in the Form C in the second schedule hereto, and from time to time, if they shall think fit, to revoke or amend such order: Provided always that every such order, amendment, and revocation shall be published in the *Calcutta Gazette*, and that no such order, amendment, and revocation shall have any force or effect until it shall have been so published.

52. During such time as any such order shall remain in force, the provisions of Rule 48 shall not apply to any vessel lying or being within the limits of any such creek, river, or dock, as the same shall be defined by such order.

53. On the occurrence of a case of cholera, small-pox, or other dangerously communicable disease on board any vessel lying in the Port, the Master shall, as early as possible, send the affected person to hospital, and shall cause the flag R to be hoisted at the fore as a signal to the Health Officer of the Port, and such signal shall not be lowered until such Health Officer has visited the vessel.

54. The Master shall afford such information in regard to the occurrence of the disease as the Health Officer may require, and shall carry out such reasonable instructions regarding the cleaning and disinfection of the vessel, and the disposal of polluted clothing, bedding, etc., as that officer may consider it necessary to give.

55. If, by reason of the prevalence of any dangerously communicable disease on board any vessel, the Health Officer and one other Medical Officer in the service of the Government at Calcutta jointly consider it absolutely necessary for the safety of the crews

of other vessels that such vessel should be segregated, the Health Officer shall furnish the Master with a certificate to that effect. The Master shall, on receipt of such certificate, forthwith give notice of accordingly to the Harbour Master, and the vessel shall be removed to Metteabrooj, or such other place as the Commissioners may direct.

56. On the occurrence of a death on board the Master shall, without delay, inform the Port Police whose permission shall be obtained before the corpse is removed.

Bye-Laws.

1. No stages, planks, poles or any article provided by the Commissioners for vessels loading or discharging shall be used without a written order from the Dock or Jetty Superintendent, and when the discharging or loading is completed they shall be replaced on the quay or jetty alongside the vessels.

All stages, planks, poles or other articles, not provided by the Commissioners, after use in discharging or loading, shall be removed within 24 working hours from the Dock or Jetty premises.

2. All the quays, sheds, gates, and the land within the Dock or Jetty fence shall be in charge of the Dock or Jetty Superintendent, who will manage all operations connected with the landing and shipping of goods, storage in the sheds and open. He will be responsible for the proper custody of all goods within the enclosure and exclusion of improper characters, and will take whatever steps may be necessary for the proper maintenance of order on the premises.

3. The allotment of a berth shall be entirely at the discretion of the Commissioners, but as a general rule vessels will be accommodated in the order of their arrival at the Dock entrance or off the Jetties.

4. Masters and owners of vessels shall obey the directions of and shall offer no obstruction to, Dock or Jetty Officers in mooring, unmooring, moving or removing any vessel from one part of the Dock or Jetties to another part or in regulating the position for loading and discharging of such vessels.

5. When berthed or moored in the Dock, a ship's propeller shall not be worked for trial by the main engines without due notice being given to, and permission obtained in writing from, the Dock Superintendent.

6. Projections from any vessel, whilst hauling in or out of Dock or to or from the Jetties, or which interfere with another vessel's loading or discharging, shall be removed on requisition by the Dock or Jetty Superintendent or other duly authorised officer of the Commissioners.

7. No fender which will not float shall be used over the side of a vessel. Sails shall only be loosed with the Dock Superintendent's permission, and must be stowed at once on his order. In all cases they must be stowed before sunset.

8. If the Dock Superintendent considers that there is good reason why a vessel should not be admitted in to Dock, he may refer the question to the Commissioners, pending whose decision he may refuse to allot a berth.

9. The Owners and or Masters of a vessel shall—

(a) Supply warping and other necessary appliances ;

- (b) Secure hatches when not in use, and guard against accidents to life, limb and property;
- (c) Keep their vessels so loaded, and or ballasted as to allow of their safe removal in the event of fire or other emergency arising;
- (d) Provide proper lights in those parts of a vessel where work is going on, and or when, owing to insufficient light, injury might result to life, limb or property;
- (e) Arrange that whilst a vessel is in Dock, or at the Jetties, the Master or some responsible officer shall always be on board in charge to superintend and assist in carrying out all duties in connection with the vessel or its cargo, and that there is a sufficient crew to carry out orders issued by the servants of the Commissioners in charge;
- (f) See that all exhaust steam or water pipes from winches or other machines are led down the side of the ship to below Dock wall coping by a hose or other appliance.

10. The owners and or Master of a vessel shall—

- (a) At the Docks securely fix the gangway supplied by the Commissioners during the whole time the vessel remains alongside the quay, and fix between sunset and sunrise one lantern at each end of a gangway so placed.
- (b) Alongside any of the Jetties provide at least one gangway plank, not less than two feet six inches wide, and of sufficient length, thickness, and strength to form a convenient communication between the Jetty and the gangway of the vessel, and such gangway plank shall be properly and securely placed between the gangway of the vessel and the Jetty during the whole time the vessel remains alongside the Jetty.

11. A preferential use of cranes shall be given for the discharge of import cargo.

12. Heavy lifts of over 35 cwts. shall be declared by Masters of vessels, who shall be responsible for all accidents arising owing to misdeclaration of weights of such lifts.

Vessels carrying heavy lifts requiring the use of the 100 ton sheers shall be moved to the 100 sheers quay to make such lifts at such time as the quay is available.

13. No crane shall be hooked on to more than it is certified to lift by itself, and two cranes shall not be hooked on to one article. No crane shall be used to assist in lifting a weight when such weight is being hoisted by the ship's own gear. Breaking out cargo with Dock or Jetty cranes is strictly prohibited.

14. Vessels requiring to carry out petty repairs may do so in the Wet Dock when a berth is available without detriment to ordinary traffic, but subject to the condition that a canvas-shoot or other safeguard be provided so as to prevent loose material, chips, pieces of wood, or other light material falling into the water.

15. Every barge or cargo boat, if permitted to remain in the Dock more than 12 hours after having received or discharged her cargo, or 12 hours after she could have received or discharged such cargo, will be subjected to a charge, as under, for every day or part of a day while she shall so remain:—

| | Rs. | As. | P. |
|---|-----|-----|----|
| Cargo boat or barge up to 15 tons | 1 | 0 | 0 |
| Do. above 15 and up to 25 tons | 1 | 8 | 0 |
| Do. above 25 tons | 2 | 0 | 0 |

16. No bum-boat will be allowed into the Dock without the special sanction of the Dock Superintendent, and any bum-boat may be removed from the Dock at any moment.

17. The control of barges, cargo boats, and bum-boats, shall rest with the Dock Superintendent, who may prevent from entering, or turn out of the Dock, any boat unless she is actually engaged for cargo, and no fires shall be allowed on them between 9 P.M. and 5 A.M.

18. Every cargo boat, barge, or bum-boat may be searched, at the discretion of the Dock Superintendent, before leaving Dock, either by a Dock official deputed to do so, or by the Police.

19. No person shall open, or attempt to open or shut, any dock gate, sluice or valve, nor any swing-bridge without orders from a duly authorised servant of the Commissioners.

20. The gates of the Dock or Jetty premises shall be kept open at hours fixed by the Commissioners, and ingress and egress allowed as directed by the Dock or Jetty Superintendent.

21. No person, unless duly permitted by the Dock or Jetty Superintendent, shall take inside the Dock or Jetty premises carpenters' tools or other instruments for opening cases, and no cooper shall be allowed to work in the sheds without a license from the Dock or Jetty Superintendent.

22. Bells must not be struck to denote the hour on board ships in Dock.

23. No vicious or dangerous animals, and no loaded gun or other fire-arm, shall be kept on board any vessel in Dock or at the Jetties.

24. No vessel having on board more than 100 Native passengers or coolies shall be allowed to enter the Wet Dock unless covered by a certificate from the Health Officer that no persons on board are suffering from infectious diseases.

25. Smoking and the use of any unprotected fire or light in any shed or warehouse within the Dock or Jetty enclosure are strictly prohibited. No person shall smoke tobacco or other substance, or ignite lucifer matches or other inflammable articles, on any pier or quay or on board any vessel within the Dock, or at the Jetties, except in such places as may be allotted for the purpose.

26. Fires of coal, charcoal, or coke may be used in the cabins, deckhouses, forecastles and cabooses of vessels in Dock, only between 5 o'clock A.M. and 9 o'clock P.M., subject to being prohibited (on any abuse) by the Dock Superintendent.

Fires for donkey engines, steam winches and portable forges are also permitted during working hours and for ship's engines for a reasonable period before a ship leaves and after a vessel is berthed in the Dock.

All lights, whether oil-lamps or candles, used on board vessels in Dock, except as mentioned in the following paragraph, shall be in globes or secured lanterns.

Naked lights may be used only in the engines and boilers of vessels whilst under inspection and repair, or in duties connected therewith.

While any fire or light is lighted, at least one person on board is to be specially charged with the care thereof; and no fire or light is to be left or used in so rash, careless, or negligent a manner as to risk or endanger the safety of or to ignite any goods, property, or vessel in the Dock or on the Dock premises.

All applications for special permission to use fires at any other than the prescribed hours shall be made in writing to the Dock Superintendent before 5 o'clock P.M., and shall specify the circumstances under which the request is made; if granted, the application, after having been endorsed by the Dock Superintendent, is to be retained on board by the

person charged with the care of the fire, and is to be exhibited by him to the Dock and Police officials whenever demanded, and is to be returned to the Dock Superintendent by 10 A.M. on the following day.

27. Vessels in Dock and all ghats thereof shall be held or made free and accessible to the Dock and Police officials for their inspection in regard to fires and lights whenever they demand it.

28. A vessel about to come into Dock is to be trimmed, if possible, on an even keel, or two to three inches by stern or head, and kept upright. Side and stern ports to be shut in.

29. A vessel entering the Dock with her water-ballast tanks full, the tanks must be kept in that condition during her stay in Dock. Should, however, necessity arise to empty a tank, the same can only be done with the sanction of the Dock Master and under his supervision.

30. Water ballast tanks, while the vessel is in Dock, shall not be filled without the previous sanction of the Dock Master.

31. No coals, cargo, or ballast to be shifted in any of the holds or bunkers after the vessel is blocked, without the special permission of the Dock Master. If done, it will be at the risk and responsibility of the Commander.

32. From the time that the Dock ropes are made fast to the ship till she is secured on the blocks, all duty on board is to cease in order that the crew may be available to trim the vessel, if required by the Dock Master.

33. As soon as a ship is in Dock, the Commanding Officer will station his men to hook on the tackles for putting the ship fair over the blocks, both forward and aft, and to assist in pulling up the shores.

34. As the safety of the ship depends on her prompt shoring, the most particular attention is requisite to the observance of the foregoing rule. No exertions of the Dock staff can affect this without the co-operation of the ship's crew.

35. Masters of vessels shall furnish special notice to the Commissioners before landing hazardous goods, *e.g.*, saltpetre, acids, sulphur, matches, spirits of wine, kerosine oil, turpentine, pitch, tar and petroleum, etc.

N.B.—Rules 28 to 34 apply only to vessels going into the Graving Dock.

36. No person shall remove from the Dock or Jetties any goods other than those for which bills-of-lading, accompanied by Agent's or Master's delivery order, Customs bill-of-entry, and Dock or Jetty *Challan*, have been deposited with the Commissioners.

37. Every package, bale, or case sent for shipment at the Dock or the Jetties shall be entered in a cart ticket in the form prescribed, and no goods unaccompanied by this ticket will be allowed to pass into the Dock or Jetty enclosure. Every cart ticket shall contain the date, name of vessel on which the goods are to be shipped, the exporter's name, the marks, quantity, and description of articles shipped, and the current license number of the cart.

38. Working hours at the Dock or at the Jetties shall be as may be notified from time to time. Wharf rent will not be charged for the days observed as holidays by the Custom House, but goods can be received and delivered on such days on payment of Custom House fees.

39. Application to work at night or on Sundays or holidays must be made to the Commissioners, who, on production of the Custom House permission, will order all the necessary arrangements for the proper conduct of business for work at night and on Sunday, and the holidays prescribed by the Commissioners, the extra rates fixed by the Commissioners from time to time must be paid.

40. The sanctioned holidays recognised by the Commissioners shall be:—

| | Days. |
|--------------------------------------|-------|
| New Year's Day | 1 |
| Sreepunchoomy | 1 |
| Good Friday | 1 |
| King's Birthday | 1 |
| Doorga and Luckhee Poojahs | 12 |
| Kally Poojah | 1 |
| Jaggodhatree Poojah | 1 |
| Christmas | 2 |
| Total | 20 |

41. No ashes, sweepings, of rubbish of any kind are to be landed on any part of the Dock or Jetty premises, except under such conditions as shall be approved by the Commissioners.

42. Except for the purpose of enabling Masters of vessels to take measurements or weighments of goods to be shipped on board their vessels, no goods shall be permitted to be stacked on the wharves beyond the time actually necessary to convey them away.

43. During the time it is actually necessary for goods in course of landing or shipping to remain on the wharves, such goods shall be piled in places assigned for the purpose by the Superintendents of the Wharves, or their subordinates.

44. Boats shall not be moored or anchored at the wharves, in order that the owners of the goods brought in them may sell or barter.

45. Empty boats waiting to be hired, or having discharged goods, shall anchor in the stream, at least 150 feet off the wharves.

46. The hours for landing and shipping goods at the Inland Vessels Wharves, shall be from 6 A.M. to 6 P.M. on all days, except Sundays and holidays authorised by the Commissioners; and no business shall be transacted on the wharves during the hours intervening between 6 P.M. and 6 A.M., nor on Sundays and authorised holidays, except on payment of overtime or extra fees respectively.

47. When goods are to be landed or shipped inward or outward, authenticated *Challans*, showing the descriptions and exact quantities of the goods, shall be tendered to the cashier by applicants for the passes. On the data furnished in these *Challans* the passes will be drawn up and the tolls levied. In the absence of such *Challans*, or where reasonable doubts exist with regard to their genuineness or correctness, the calculation for levying the toll shall be based on the registered tonnage of the boats or vessels from which the goods are to be landed, or on which they are to be shipped.

48. No unauthorised person shall lay hold of, or get into or upon, any engine, carriage, or truck on the Commissioners' tramway.

49. No driver shall drive his engine over the Commissioners' tramway at a greater rate of speed than six miles an hour.

50. No person shall cross the Commissioners' tramway in front of an approaching engine, or between or under any vehicle standing or moving on the line.

51. No person shall remove or wilfully damage any lamp, engine, carriage, truck, fencing, or any other property whatever belonging to the Commissioners.

52. No person shall place any obstruction upon the Commissioners' tramway.

53. No person shall walk along the Commissioners' tramway within the fencing.

54. No person shall allow cattle in his or her charge to trespass on the Commissioners' tramway, nor to cross the line except at the regular crossings.

55. No person shall smoke within any of the sheds and warehouses belonging to the Commissioners.

56. Any person committing an infringement of any of the foregoing Bye-laws shall be liable to a fine not exceeding Rupees 500, and, when the breach is a continuing breach, to a further fine, which may extend to Rupees 200 for every day after the first during which the breach continues.

Rules under Explosives Act IV. of 1884.

N.B.—“Explosive” as defined in Section 4, Act IV. of 1884, and as used in these rules—

- (a) Means gunpowder, nitro-glycerine, dynamite, gun-cotton, blasting powder, fulminate of mercury or of other metals, coloured fires, and every other substance, whether similar to those above mentioned or not, used or manufactured with a view to produce a practical effect by explosion or pyrotechnic effect; and
- (b) Includes fog-signals, fireworks, fuzes, rockets, percussion caps, detonators, cartridges, ammunition of all descriptions, and every adaptation or preparation of an explosive as above defined.

1. Except as in hereinafter provided for, no vessel shall have on board, within the limits of the Port, any explosive, as defined in Section 4, Act IV. of 1884, except 15 lbs. common gunpowder, in addition to 12 rockets and 12 blue-lights. All explosives which vessels are by this rule permitted to keep on board shall be stored in a copper magazine, out of risk of fire and explosion.

All explosives which by this rule may be ordinarily retained on board vessels in Port shall be discharged before a vessel is taken into dry dock.

2. All inward-bound vessels, carrying explosives in excess of 15 lbs. of common gunpowder, in addition to 12 rockets and 12 blue-lights, are prohibited from proceeding above Budge-Budge, and the Master of any vessel lying within the Port which shall have on board any explosive in contravention of these rules shall be liable to a fine which may extend to the sum mentioned in clause (a) or clause (b), as the case may be, of the proviso to section 5 of the Indian Explosives Act, 1884.

3. Explosives of classes 1, 6 and 7, as laid down in the rules issued under Government of India Notification No. 1417, dated 24th June, 1887, that is to say, gunpowder, ammunition, and fireworks in excess of the quantity prescribed in Rules 1 and 2, shall be landed and deposited in the Magazine at Moyapore.

4. For the convenience of vessels having ship's gunpowder on board a properly constructed powder-boat will be always in attendance off the Magazine for landing and shipping the powder. No charge will be made for the use of the boat for landing ship's powder, but the responsibility of the Keeper in respect of the ship's powder shall not commence until it is landed on the bank, and shall cease as soon as it is shipped on board the boat. Every precaution will be taken to insure the safety of the powder while in the boat, but the landing and shipping shall be at the risk of the vessel.

5. Vessels bringing consignments of trade explosives shall be allowed the use of the Magazine boat, but should passing vessels require the use of the boat to put out or take

in ship's powder, such vessels shall be accommodated before the boat can be used to discharge explosives brought as cargo. The landing of such consignments, whether the station boats or private boats are employed, shall be at the risk and expense of the consignees of the explosives, and no liability shall be accepted for damage sustained while in course of landing or until the consignments are stored in the Magazine.

6. Explosives specified in the first division, class 6 of the rules published under Government of India's Notification No. 1417, dated 24th June, 1887, viz., safety cartridges, safety fuzes for blasting, railway fog-signals, and percussion caps, brought as part of a general cargo, and which have been placed on board the vessels while lying in dock at ports of shipments may be brought into port and landed at the docks or jetties in accordance with the regulations prescribed in that behalf in the Port Commissioners' Bye-laws.

7. In order to avoid unnecessary detention, Masters of vessels requiring the use of the powder-boat shall hoist a flag at the fore-topmast head on coming in sight of the Magazine as a signal to the keeper to have the boat and coolies in attendance.

8. Masters of vessels shall mark the names of their respective vessels on the barrels and packages of ships' gunpowder previously to their being landed; if not marked, they shall not be received by the Magazine boat.

9. Explosives shall not be landed or received into, or delivered from, the Magazine when artificial lights are required to be used.

10. The Magazine-keeper shall give to the Master of any vessel landing explosives at the Magazine a receipt for the number of packages, and the Magazine-keeper shall be accountable to such Master for the re-delivery of such packages.

11. Before entering the limits of the port, the Master of every vessel having explosives on board shall make and sign a declaration in writing that to his knowledge and belief there is not on board any explosive exceeding the quantity prescribed in these rules.

12. A clerk shall be always in attendance in the powder-boat, and shall receive from the Master the declaration specified in the foregoing rule.

13. If any vessel shall be prevented, by stress of weather, or by being in distress, from landing or depositing such explosives in excess of the quantity allowed as aforesaid, such vessel may be permitted to come up to the lower limits of the port, but shall not proceed above Matteabrooj Ghat, and the Master of the vessel shall forthwith give notice to the Harbour Master of his having such explosives on board, and shall obey the Harbour Master's directions relating to the same.

14. Masters of vessels outward bound who may require ship's gunpowder for their outward voyage shall not take such powder on board in any part of the river above Budge-Budge, with the exception of a quantity not exceeding 15 lbs. of common gunpowder in addition to 12 rockets and 12 blue-lights.

15. Masters of vessels who have deposited ship's powder at the Magazine shall inform the Harbour Master of the date on which the vessel will pass the Magazine outward bound, and on receipt of this information orders shall be forwarded to the Keeper to place the powder in the boat and send it off in such time as to avoid any detention of the outward-bound vessel. Before taking the powder on board, the receipt granted by the Magazine-keeper shall be given up.

16. Boats shall be permitted to take on board at the Moyapore Magazine and bring as far as Neemuck Mehal Ghat, under cover of passes to be granted by the Commissioner of Police and the Port Commissioners, 50 lbs. of trade gunpowder, the property of dealers and consignees.

17. Delivery of trade powder into boats at the Moyapore Magazine for conveyance to Calcutta shall only be granted upon order issued by the Port Commissioners.

18. No boat containing powder under the provisions of Rules 17 and 18 shall be allowed to proceed above Neemuck Mehal Ghat. All such powder shall be landed at Neemuck Mehal Ghat, and no powder shall be landed at any other ghat, except with the special permission of the Port Commissioners.

19. No smoking, and no fire or light of any description except the red lamp between sunset or sunrise, shall be permitted on board of any boat having explosives on board.

20. No explosives shall be landed within the Port at any time when artificial lights are required to be used.

21. Masters of vessels having on board explosives belonging to the following classes, as laid down in the rules prescribed in the Notification of the Government of India, Home Department, No. 1417, dated 24th June, 1887, must make their own arrangements for the discharge of the explosives:—

- Class 2. — Nitrate Mixture.
- „ 3. — Nitro Compound.
- „ 4. — Chlorate Mixture.
- „ 5. — Fulminate.

22. Explosives of the classes specified in the foregoing rule shall not be landed at the Moyapore Magazine, and shall only be allowed to enter and pass through the Port under the supervision of the Port Police, and subject to such restrictions as may from time to time be ordered by the Commissioner of Police and the Port Commissioners, in addition to the restrictions laid down in the rules promulgated by the Government of India under Notification No. 1417, dated 24th June, 1887.

23. Boats containing explosives of the classes specified in the two foregoing rules shall in no case anchor within Port limits, or be made fast at any part of the river bank or alongside any vessel, stage, jetty, or pier within the limits of the Port. Such boats, if allowed to enter Port, shall proceed direct through the Port to the place licensed by the Local Government for the landing and storage of the explosives.

The Commissioners for the Port of Calcutta.

SCHEDULE H.

KIDDERPORE GRAVING DOCK.

REVISED SCALE OF CHARGES.

Dimensions—

| | |
|---------------------------------|-----------|
| Length on blocks | 520 feet. |
| Width at entrance | 67 „ |
| Least depth on blocks | 23 „ |

The Dock is intended principally for the painting and cleaning of vessels, and the execution of very slight repairs. Its use for heavy repairs will only be given in special circumstances.

The terms are as follows, and will include removal of vessels from Tidal Basin into Graving Dock and back, docking, pumping, shoring, and undocking; also the use of stages and stage-ropes for cleaning and painting:—

| | Rs. | As. | P. |
|--|-----|-----|----|
| For the first 24 hours, with a minimum of Rupees 400, per gross ton | 0 | 6 | 6 |
| For every subsequent 24 hours, up to a total of 8 days from entering per day | 200 | 0 | 0 |
| From 9th to 20th day „ | 300 | 0 | 0 |

After 20 days, the Commissioners reserve to themselves the right to increase the daily charge up to any sum not exceeding Rupees 500.

A vessel engaging the Dock, and not using it, will be charged Rupees 300.

The Commissioners will not undertake the work of cleaning, painting or repairing vessels. Owners, Agents, or Masters will have to make their own arrangements for the execution of the work.

No commission or other fees will be levied on stores brought either by land or water into the Dock for cleaning, painting, or repairing.

No Dock dues will be charged on vessels passing through the Tidal Basin to or from the Graving Dock.

Rules under Petroleum Act XII. of 1886.

Preliminary.

1. (i) All words and expressions used in these rules, and defined in the Act, shall in these rules have the meanings respectively assigned to them by the Act.

(ii) In these rules:

“Certificated petroleum” means petroleum covered by a certificate granted at the port of shipment, of such description as the Local Government may, from time to time, by written order, prescribe, and to the effect that the petroleum is not dangerous petroleum.

“Uncertificated petroleum” means petroleum which the Master of the ship has not declared under rule 2 to be dangerous petroleum, and which is not covered by a certificate as aforesaid.

Importation at Calcutta.

2. The Master of every ship bound for Calcutta, and carrying petroleum shall, before reaching Budge-Budge, declare in writing to the pilot,* if there is one on board—

(a) what quantity of petroleum the ship is carrying,

(b) whether any, and if so what, part of the petroleum is dangerous petroleum,

(c) whether any, and if so what, part of the petroleum is certificated petroleum.

If there is no pilot on board, the Master of such ship shall, before reaching Budge-Budge, despatch a similar declaration to the address of the Vice-Chairman of the Port Commissioners.

* The pilot should deliver this declaration to the Harbour Master or his Assistant, when the latter comes on board, for transmission to the Vice-Chairman of the Port Commissioners.

When the Master declares that any petroleum is certificated petroleum, he shall produce to the pilot the certificate covering the same.

3. A ship having petroleum on board may proceed to any mooring in the Port and there discharge the petroleum—

- (a) if the petroleum has come from a port in British India as part of a general cargo, and has been certified not to be dangerous under section 9 of the Act, and does not exceed five thousand gallons in quantity, or
- (b) if the petroleum is certificated petroleum not exceeding five thousand gallons in quantity and the Master produces the certificate to the pilot, or
- (c) if the petroleum is dangerous or uncertificated petroleum not exceeding forty gallons in quantity, or
- (d) if the petroleum is petroleum which is ordinarily used for lubricating or jute-batching purposes, and which has a flashing-point above 150° of Fahrenheit's thermometer.

The Commissioner of Police may, at any time, if he thinks it necessary, call on the Superintendent of the Petroleum Wharf to obtain and forward to him a sample of any petroleum referred to in clause (a) or (c) for the purpose of having it tested, and the Superintendent shall obtain and forward the sample accordingly.

4. Every other ship having petroleum on board shall not proceed upwards further than Budge-Budge, and such petroleum, whether landed at the Petroleum Wharf or otherwise discharged, shall be detained there pending the grant of an import licence under Section 5 of the Act, or the issue of a certificate under section 9 of the Act, or the issue by the Local Government of directions regarding it.

5. (i) When a ship is stopped at Budge-Budge under rule 4, the Superintendent of the Petroleum Wharf shall, as soon as possible, not exceeding forty-eight hours from the time of the petroleum being landed or discharged into boats, obtain samples of all the petroleum landed or discharged, or intended to be landed or discharged. The Master shall deliver to the Superintendent without charge such samples as he shall take.

(ii) Every different quality of petroleum shall be separately sampled and when petroleum is represented to be of uniform quality, a sample shall be taken from one case in every ten thousand cases, or, if the petroleum is carried in bulk, from each separate compartment of the ship in which it is carried.

(iii) The Superintendent shall forthwith seal the receptacles containing the samples, and having labelled them with the name of the ship, the name of the consignee, and such other distinguishing marks as may be necessary, shall forward them to the Testing Officer appointed under section 9 of the Act for report.

6. The Testing Officer shall, as soon as practicable, and ordinarily within twenty-four hours after the receipt of the samples, sign a report certifying that they are, or are not, dangerous petroleum (as the case may be), and shall forward such report to the office of the Port Commissioners, sending also a copy of the same to the Commissioner of Police. The Vice-Chairman of the Port Commissioners shall, on receipt of such report, forthwith forward a copy of the same to the Master of the ship in which the petroleum was imported.

7. Unless with the written permission of the Port Commissioners, no petroleum shall be discharged or landed within the Port of Calcutta, except between daylight and dark, and at the wharves expressly set apart for the landing of petroleum.

8. (i) No smoking, fire, or light of any description shall be allowed in any shed reserved for the storage of petroleum at the Budge-Budge Wharf, or used by the Port Commissioners for the temporary storage of petroleum brought into the Port under rule

3, and no receptacle containing petroleum shall be opened, or the contents drawn off, within the embankments enclosing the sheds constructed for the storage of petroleum, except in such special place or places in the depot as may be set apart by the Port Commissioners for that purpose.

(ii) When petroleum is imported in bulk, its removal from the ship shall be effected by means of a hose and a wrought iron pipe between sunrise and sunset. Petroleum so imported shall be pumped into storage tanks, and when the ship has finished discharging the pipe shall immediately be emptied by means of a supplementary pump on shore. When the ship has not finished discharging by sunset, arrangements must be made by means of a valve for effectually preventing any of the oil left in the pipe from escaping.

N.B.—Rules 9 to 15 refer exclusively to importation of petroleum at Chittagong and other ports, and are not applicable to the Port of Calcutta.

General.

16. The fee for sampling and testing petroleum shall be five Rupees for each sample tested.

17. When petroleum is imported in bulk, the contents of each compartment of the tankship shall, for the purposes of sub-section (1), clauses (e) and (f) of section 8 of the Act, be regarded as a separate consignment.


18. When the results of the testing of samples raise a doubt as to the uniformity of the quality of the petroleum in any consignment stated to be of one uniform quality, the Testing Officer, if he thinks further tests necessary to satisfy him that none of the petroleum is dangerous petroleum, shall inform, in Calcutta, the Superintendent of the Petroleum Wharf; in Chittagong, the Collector of Customs; or in places other than Calcutta and Chittagong, the District Magistrate.


The District Magistrate, or, in Calcutta, the Superintendent of the Petroleum Wharf, or, in Chittagong, the Collector of Customs, or any Police Officer of, or above the rank of Head Constable appointed by him in writing for the purpose, shall thereupon cause the petroleum in question to be landed and stacked in lots of 1,000 cases each, or to be discharged into boats each containing five hundred cases; and he shall select and deliver to the Testing Officer one sample from each lot. The result of the testing of each of these samples shall determine the quality of the lot which such sample represents.


If the petroleum has been already landed and stored, it shall be divided into lots, and samples of each lot shall be selected as already stated.


19. Nothing in the foregoing rules applies to petroleum, other than dangerous petroleum, comprised in a ship's stores, and manifested as such, provided it is not of unreasonably large amount. If any question arises as to whether any petroleum, manifested as ship's stores, is of an unreasonably large amount, the decision thereon of the Port Commissioners in Calcutta or Chittagong, and of the District Magistrate elsewhere, shall be final.


**Should any accident happen to the River Semaphores,
the following signals will be used until the
repairs are effected.**

1 foot ...  a Cone

2 feet ...  two Cones... ..


3 „ ...  inverted Cone

4 „ ...  two inverted Cones


5 „ ...  a Cone and inverted Cone ...


Leading indicator
for under one
fathom—Cone.




6 feet ...  a Ball

22


7 „ ...  a Ball and Cone

8 „ ...  a Ball and inverted Cone


Leading indicator
from one to two
fathoms—Ball.


9 „ ...  two Balls

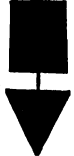



10 „ ...  a Ball and Drum


11 „ ...  a Ball and Diamond


12 feet ...  a Drum

13 „ ...  a Drum and Cone

14 „ ...  a Drum and inverted Cone ...






15 „ ...  a Drum and Ball

16 „ ...  two Drums

17 „ ...  a Drum and Diamond

Leading indicator
from two to three
fathoms - Drum.



| | | | | | | |
|---------|-----|---|-----------------------------|-----|-----|-----|
| 18 feet | ... |  | a Diamond | ... | ... | ... |
| 19 „ | ... |  | a Diamond and Cone | ... | ... | ... |
| 20 „ | ... |  | a Diamond and inverted Cone | ... | ... | ... |
| 21 „ | ... |  | a Diamond and Ball | ... | ... | ... |
| 22 „ | ... |  | two Diamonds | ... | ... | ... |

Leading indicator
for three fathoms
and upwards—
Diamond.



Balasore, in Latitude $21^{\circ} 28' N.$, Longitude $87^{\circ} 2' 30'' E.$, is a town of some importance, and rice and paddy are exported in large quantities to Ceylon and Mauritius, and the islanders from the Laccadive and Maldivé Islands visit the port for their supply of grain.

The port of Balasore consists of that portion of the Burábalang ("old twister") river fronting the town, and is about 16 miles from the entrance to the river, and 22 miles from the deep water anchorage.

There is the usual bar at the mouth of the river, which is practically dry at low water spring tides. High water gives a rise of 13 feet, and the comfortable paddle steamers of the Indian General Steam Navigation Company call once a week, and moor head and stern opposite the Custom House. The channel is properly buoyed.

The entrance to the river is marked by the flagstaff which is painted black, and from which is exhibited a white dioptric light of the 6th order, visible in fine weather about 10 miles, and illuminating an arc from $N. 11^{\circ} E.$, through West to $S. 79^{\circ} W.$ The height of the light is 62 feet above high water level.

The land round Balasore is bleak and barren, and the only land marks are the Chandipur Flagstaff and a few small hillocks to the north-eastward.

A large Black Buoy with staff and cage, known as the Balasore Buoy, is laid down to indicate the edge of the mud-flats.

It is high-water, full and change, at 9 hrs. 45 min. mean time.

The best anchorage for large steamers is with the Chandipur Flagstaff bearing $N. 56^{\circ} W.$ magnetic, and the Black Buoy $N. 69^{\circ} W.$ magnetic; these bearings will give 4 fathoms at low water spring tides in sand and mud, and good holding ground.

There are only a limited number of boats, and vessels generally experience much delay; coolies are available for working cargo, which costs about $3\frac{1}{2}$ Annas per ton.

There is a Superintendent of Customs in charge of the port, who is also Conservator.

Fresh water is obtainable, but is not good, and all stores and provisions must be procured from Calcutta.

Chandbally is a river-port about eight miles from the entrance of the Baitarani or Dhamra River, which has risen to importance within the last 20 years, and is now the centre of a rapidly growing trade, principally with Calcutta.

To face page 50.

The fixed white light at Balasore in $21^{\circ} 26'$ N., $87^{\circ} 2'$ E., is now visible in all directions seaward from N. 35° E. through W. to S. 35° W.

Several large and fast steamers call here twice a week from Calcutta, and there is also a river service to Cuttack, which is in connection with the East Coast Railway.

Vessels are moored head and stern in the river alongside the jetties. Pilots can be obtained if necessary, and one is usually to be found at Shortts Island Lighthouse.

The passenger traffic with Calcutta is considerable, amounting to about 40,000 persons annually, either way. Many of these passengers are pilgrims on their way to and from the shrine of Jagannath, and there is also a large local passenger traffic of Uriyas, who come to Calcutta and are employed as domestic servants and as stevedore's labourers.

Six miles to seaward of the entrance to the river there is a light on Shortts Island, in Latitude $20^{\circ} 47' N.$, Longitude $87^{\circ} 4' E.$ The light is exhibited from a masonry tower of red stone, and the centre of the light is 78 feet above high water level, and is a white, flashing, dioptric light of the 3rd order, showing alternate flashes and total eclipses, with an interval of 15 seconds between the flashes, and is visible in clear weather about 14 miles.

Shortts Island beacon has been re-erected 136 feet *W.* by *S.* of its former position. One of the Elfin Channel transit marks has been washed away.

The light has been discontinued in consequence of the dangerous nature of the structure of the lighthouse.

A 6th order dioptric, fixed white light is exhibited from a masonry tower in Shortts Island visible 12 miles between the bearings *S.* through *H.* to *W.N.W.* (Mag.).

An independent fixed light is also shown from an opening to the westward of the tower, at a height of 38 feet above high water level, which shows narrow green and red sectors, separated by a white ray defining the channel into the river. This light is not visible, except when to the westward of the lighthouse on Shortts Island.

The channel is well buoyed, but the channels are continually changing. Labour is abundant and inexpensive, and the cost of landing and shipping is 4 Annas a ton.

The port and all conservancy matters are in the charge of a Port Officer; there is also a Customs Official. The rivers are buoyed according to the uniform system of buoyage.

Fresh water can be obtained, but no coals, and only a limited

supply of provisions of poor quality. All stores must be procured from Calcutta.

Palmyras shoals extend about 8 miles to the eastward of Shortts Island Lighthouse, and have depths on them of from 1 to 5 fathoms at low water. From their *S.E.* extreme, where there is $4\frac{3}{4}$ fathoms, the lighthouse bears *N.W.* $\frac{1}{2}$ *W.* about $8\frac{1}{2}$ miles distant,

False Point Harbour is said to take its name from the circumstance that it was often mistaken by ships for Point Palmyras. The harbour consists of an anchorage, land locked by islands and sandbanks, with two navigable channels. It is safe and roomy, and the channels are properly buoyed.

The port is now open throughout the year, but its importance has only been appreciated within the last 30 or 40 years. It is a regular port of call for the coasting steamers belonging to the British India Steam Navigation Company, and sailing ships occasionally load rice for Mauritius.

The harbour is formed by the Island of Dowdeswell, extending in a north-westerly direction, the extreme northerly point of land being 7 miles *N.N.E.* of the lighthouse, and consists of a few broken pieces of land with very low jungle on them.

Reddie Head has re-formed since the disastrous cyclone of September, 1885, but is liable to be washed away at any time.

Hookey Tollah has been entirely washed away, and there is now only the Refuge House and a few cocoanut trees left standing.

The new Refuge House is a large stone building, and can easily be distinguished from seaward. It has a flagstaff to the westward of it

The outer coast line consists of low islands, covered with jungle, and extending 2 miles east of the lighthouse, which trend gradually round until they meet Dowdeswell Island. During easterly gales a heavy surf gets up on the beach.

Jumboo bungalow was built in 1876, and is situated on the left bank of the Soonta Creek, and shows up well from the anchorage.

The lighthouse, in Latitude $20^{\circ} 20' 20''$ *N.*, Longitude $86^{\circ} 44' 27''$ *E.*, is situated at the entrance to the Mahanadi river, about $1\frac{1}{2}$ miles west of Mahanadi point, and $5\frac{1}{2}$ miles from the sea.

It shows an occulting, white, dioptric light of the 1st order, obscured 4 seconds once in every half minute, illuminating an arc of 200° from *S.S.W.* through West and North to *N.E.* $\frac{1}{4}$ *N.*, and standing 127 feet above high water level, and is visible in clear weather 19 miles.

The lighthouse column is built of laterite and is painted red, with a large white tenpointed star facing *S.W.*

Vessels can communicate with Calcutta by telegraph from the lighthouse by hoisting the usual flag signals.

From December to March fog and mist occasionally rise over the land and interfere with the brilliancy of the light, and sometimes cause it to appear as a red light, or disappear as if suddenly extinguished; the lead should therefore be kept going constantly in foggy weather, and when the arming on the lead shows sand mixed with the mud the vessel should be kept out until daylight.

During the cyclone in September, 1885, the water rose 20 feet above low water, and a stone has been laid down to mark the spot.

Three quarters of a mile within Temple Point, or the west shore of the bay, is a remarkable tree, the highest in its vicinity, and known as Temple Tree, with a pole and black basket projecting from its top, which bears from Dowdeswell Island tripod *W.* $\frac{1}{2}$ *S.* distant about 4 miles.

Buoys. Fairway Buoy, black and white horizontal, lies in $4\frac{1}{2}$ fathoms lowest spring tides, with Temple Tree bearing *W.S.W.*, and Hookey Tollah Flagstaff *S.* $\frac{1}{4}$ *W.* distant $2\frac{3}{10}$ miles.

Outer Western Buoy, red, with staff and cone, lies in 20 feet *N.* by *W.* $\frac{1}{4}$ *W.* $2\frac{3}{10}$ miles from Hookey Tollah Flagstaff, and indicates the western side of the Fairway Channel.

Outer Spit Buoy, a black buoy, surmounted with a spire and black drum, lies off Reddie Point in 22 feet *N.* $\frac{1}{2}$ *W.* 2 miles from Hookey Tollah Flagstaff.

Inner Spit Buoy, a 5th class black buoy, lies in 22 feet of water *N.* by *W.* $2\frac{1}{10}$ miles from Hookey Tollah Flagstaff.

The position of these buoys are, however, liable to be changed from time to time as the sands extend into the channels.

Vessels from the southward, bound to False Point, during the *S.W.* monsoon, on approaching the lighthouse should not shoal to less than 10 fathoms. When the light bears *N.W.* alter course to *N.N.E.* until the tripod on Dowdeswell Island bears *N.W.* $\frac{1}{2}$ *W.* Thence a *N.W.* by *N.* course for about $3\frac{1}{2}$ miles will place a vessel in $6\frac{1}{2}$ fathoms, mud, about 1 mile from the shore with the tripod bearing to the southward of west. Stand in until Temple Tree, and the Jumboo buildings are well open to the northward of Dowdeswell Island, and anchor as convenient. Vessels can take up any position between the buoys

marking the channels, according to their draft and length of stay in port. The best anchorage for steamers is in 4 fathoms, mud, with tripod and cross beacons in one and flagstaff *S. 8° E.* (magnetic).

It is high water full and change of the moon, at 9 hrs. 15 min., and ordinary spring tides rise 7 feet; neaps rise 4 feet.

Water can be procured, but stores and provisions are scarce and expensive and should be procured from Calcutta.

The exports are rice, horns, hides and oil seeds.

The imports are principally European stores.

There are 60 boats with a total capacity of 2,100 tons, and there are sufficient boatmen for the requirements of the port; labour is expensive, and the cost of working cargo is 4 to 7 Annas a ton.

Cyclones are likely to be experienced from May to November.

A Port Officer is in charge of the port, and he is also the Customs authority.

Puri is the southermost port in the Bengal Presidency, and is an open roadstead.

The flagstaff bears *S. 33° E.* from the Jugannath Pagoda.

The best anchorage is as follows:—

| | | |
|--------------------------|------------------|--------------------|
| Lighthouse | <i>N. 6° E.</i> | } True Bearings |
| Flagstaff | <i>N. 5° W.</i> | |
| Northern Boundary Pillar | <i>N. 35° E.</i> | |
| Southern Boundary Pillar | <i>N. 40° W.</i> | |

in 7 fathoms clay, and the lead should be in constant use when approaching the anchorage as the beach is very steep to, and the water shoals very quickly; it is good holding ground, the bottom being nearly all clay.

The light, in Latitude $19^{\circ} 48' N.$, Longitude $85^{\circ} 49' E.$, is placed on the *S.W.*, corner of the parapet wall of a building known as the Circuit House.

It is a fixed, white, dioptric light of the 6th order, and is visible in clear weather about 11 miles from every direction seaward.

The word "**Pooree**" is painted in large letters on the front wall of the Circuit House. The Government buildings, which are all whitewashed, are conspicuous objects from seaward.

It is high water, full and change of the moon, at 9 hours 20 minutes, and the ordinary spring tides rise 6 feet, and the neap tides $8\frac{1}{2}$ feet.

The only export is rice, of which about 200,000 Bengal maunds are exported annually to Ceylon and Cochin, and an occasional shipment to Mauritius.

The only imports are Government stores, treasure for the temples, and gunny bags from Calcutta.

There are 50 masulah boats belonging to the port, representing 100 tons, and there about 400 boatmen available in the working season. Labour is abundant and cheap, and the cost of working cargo is from 4 to 6 Annas a ton ; shipping rice costs about 3 Rupees per 100 bags.

The Deputy Collector is the chief Port and Customs authority. Port dues are 1 Anna per registered ton.

Fresh water can be obtained, but all stores and provisions are very dear and scarce, and should be procured from Calcutta.

Cyclones may be experienced from May to November.

It is an occasional port of call for the B.I.S.N. Co.'s steamers, and pilgrims to the temples are occasionally brought to this port from Calcutta direct.

CHAPTER II.

Eastern Ports in the Madras Presidency.



Ganjam is the northernmost port in the Madras Presidency, and was formerly the chief town in the Ganjam District, as well as the principal port. Both town and port have been deserted, and there is now no trade except an occasional consignment of railway material for the East Coast Railway, for which purpose the port was re-opened as a customs port in 1894, but has again been closed in 1897.

The flagstaff is in Latitude $19^{\circ} 22' N.$, Longitude $85^{\circ} 10' E.$, and the best anchorage is with the flagstaff bearing *W.* in $4\frac{1}{2}$ fathoms and very good holding ground.

There are some white buildings close to the flagstaff and a remarkable looking bluff known as Paloo Bluff, 580 feet high, about 4 miles *N.E.* of the flagstaff.

There are now no boats belonging to this port as the place is deserted. It is within the jurisdiction of the Port Officer of Gopalpore.

Gopalpore is the principal port in the Ganjam District. The flagstaff is in Latitude $19^{\circ} 13' N.$, Longitude $84^{\circ} 52' E.$, and is painted white and is the only flagstaff on this coast which has a top gallant mast. The light is exhibited from a platform at a height of 54 feet above high water level. It is a fixed, white, dioptric port light of the 4th order, and is visible seaward from *N. $45^{\circ} E.$ to $S. 45^{\circ} W.$* , and can be seen 10 miles in clear weather.

There is also a small red light on the extreme end of the pier head, elevated 25 feet above high water level, and visible about 3 miles.

The South Port Pillar, as shown by the 1899 survey, has been moved, and now bears *S.W. $\frac{1}{4}$ W.* from the Port Flagstaff, distant $6\frac{3}{4}$ cables.

It is an open roadstead with no shelter whatever, but landing and shipping operations are possible throughout the year, except occasionally when the surf is too high.

There is an iron screw-pile pier, between 900 and 1,000 feet long, but it is not much used, nearly all the cargo being landed and shipped on the beach.

The best Anchorage is in about 6 to 7 fathoms, mud and sand, and good holding ground, on the following bearings : —

| | | |
|--------------------------|-----------|-------------|
| Flagstaff | N. 36° W. | } magnetic. |
| Northern Boundary Pillar | N. 1° W. | |
| Southern Boundary Pillar | N. 83° W. | |

The word “ **Gopalpore** ” is printed in large letters on the front of Messrs. Minchin and Co.’s office, and can be seen a long way from seaward.

It is high water, full and change of the moon, at 9 hours 40 minutes, and spring tides rise $6\frac{1}{2}$ feet and the neap tides about $4\frac{1}{2}$ feet.

The principal exports are rice and paddy, hides and skins, hemp, salwood sleepers, and sugar.

The principal imports are cotton twist, piecegoods, iron, stones, and gunny bags.

It is a regular port of call for the B.I.S.N. Co.’s coasting steamers, and many outside steamers load here with rice and paddy for Cochin and elsewhere.

There are 84 boats with a total capacity of about 130 tons, and there are generally sufficient boatmen to man 50 boats.

The cost of working cargo is about 4 Annas a ton, and the cost of landing and shipping varies according to the season and the material handled. Shipping paddy and rice costs 4 Rupees per 100 bags, and awkward cargo about 50 per cent. more.

The Port Officer is the chief authority and has 1st Class Magisterial powers; he is also Shipping Master and Emigration Officer.

Fresh water is obtainable in casks at 3 Rupees per two hundred gallons, and stores and provisions can be obtained.

The port is generally healthy, though feverish at times, and the district occasionally suffers from famine.

There is no hospital closer than Berhampore, but emergent cases will always be admitted into the Local Fund Dispensary.

A large passenger trade is carried on between this port and Burma by the steamers of the B.I.S.N. Co.

The weather is fine from December to May, and uncertain during the rest of the year, when cyclones may be experienced.

Sonapore is a small port in Latitude $19^{\circ} 6' N.$, Longitude $84^{\circ} 47' E.$, and may be distinguished from seaward by a white obelisk and a white column, each about 50 feet high and nearly on sea level. There is also a small Custom House on the beach and a flagstaff, painted black.

The best anchorage is in $4\frac{1}{2}$ fathoms, sand and mud, about 1 mile from the beach, with the flagstaff bearing *W.*, and the obelisk and column just open.

There is no trade, however, at this port, nor any facilities for working cargo.

Investigator Rock, in Latitude $18^{\circ} 58' 30'' N.$, is the only danger off this part of the coast and is $\frac{8}{10}$ of a mile from the coast off Kowita, and has 8 feet of water on it. The sea does not break on it nor is the water discoloured. There is a beacon and high tree on Kowita tableland.

Baruva, or Barwah, is a small port in Latitude $18^{\circ} 42' 30'' N.$, Longitude $84^{\circ} 34' E.$ It may be distinguished by two columns, black, and black and white, in horizontal bands, 50 feet high, built on a site 15 feet above sea level.

The flagstaff is painted white, and 2 white lights are occasionally exhibited to indicate the position of the port and to guide the coasting steamers to the anchorage; these lights are not, however, to be relied upon for purposes of navigation; the lights are shown from the yard arm at a height of 46 feet above high water level and are visible about 3 miles.

The best anchorage is in $4\frac{1}{2}$ fathoms, sand and mud, with the flagstaff bearing from *N.W.* to *N.W.* by *W.*

There is very little trade but the steamers belonging to the B.I.S.N. Co. call here weekly to and from Rangoon, and a large number of native passengers embark and disembark here during the fair season.

A Sea Customs Superintendent is in charge of the port, who is subordinate to the Port Officer of Gopalpore.

There are sufficient boats for the passenger traffic and the requirements of the port, and labourers can be obtained, if necessary.

There is a rocky patch which should be avoided when approaching Barwar from the southward ; it lies in the 10 fathom line and has $6\frac{1}{2}$ fathoms on it and possibly less, as one steamer has reported having struck the reef. It is about $1\frac{1}{4}$ miles from the shore and 3 miles *E.N.E.* of Rati Beacon.

Rati Beacon, in Latitude $18^{\circ} 46' 45''$ N., is an obelisk 14 feet high, situated on a small double peaked hill, 342 feet high.

There are two small ports between Barwah and Calingapatam, named **Poondy** and **Bavanapadoo**, but there is now no trade whatever, and no further mention need be made of them. They may be distinguished by passing steamers by the obelisks, which at the former port is painted white, and at the latter black and white horizontally, both being about 50 feet high, and only a few feet above high water level.

Calingapatam is a port of some importance, in Latitude $18^{\circ} 19' N.$, Longitude $84^{\circ} 7' 30'' E.$

It is the capital of the ancient Kalinga, and one of the earliest seats of Muhammedan Government in the Telugu country. Signs of its ancient greatness are still visible in the ruins of mosques and other large buildings. It is said that after heavy rain a mound, which covers the site of the old city, gives up small coins of great age and value.

A good landmark, when approaching the port, is Gara Hill, about 4 miles to the westward and 407 feet high with a single tree and two temples on its slope.

The Light, which was altered and improved in September, 1895, is situated on the sandy point to the southward of the port, and is a white, occulting, dioptric light of the 4th order, occulting every half minute, $27\frac{1}{2}$ seconds lights and $2\frac{1}{2}$ seconds eclipse ; it is visible from all directions seaward at a distance of 14 miles in clear weather.

The light is intended to warn vessels of a small reef, which projects from the point and which should not be passed in less than 8 fathoms when making the port at night.

The column is built of cut stone and is painted white, with a ladder painted red outside.

The best anchorage in the *N.E.* monsoon is in 4 to 5 fathoms, sand and mud, on the following bearings :—

| | | |
|----------------|----------------------|-----------|
| Port Flagstaff | N. 68° W. } | magnetic. |
| Lighthouse | S. 22° W. } | |

In the *S.W.* monsoon it is advisable to anchor a little further out in 6 fathoms, with the same bottom and good holding ground on the following bearings :—

| | | |
|------------------------|-----------------------|-------------|
| Calingapatam Flagstaff | <i>N.W. ½ W.</i> | } magnetic. |
| „ Lighthouse | <i>S.W. × S. ¼ S.</i> | |

It is high water, full and change of the moon, at 8 hours 30 minutes and spring tides rise $5\frac{1}{2}$ feet, neap tides about 3 feet.

The principal exports are gingelly and niger seeds, mustard seed, and rice and paddy, amounting in value to 1,100,000 Rupees per annum.

The imports are principally European goods, machinery, brass ware, and cotton yarn, valued at 400,000 Rupees.

It is a regular port of call for the coasting steamers belonging to the B.I.S.N. Co., and an occasional outside steamer calls to load for Malabar Ports and elsewhere.

Large numbers of native passengers arrive at this port on their way to and from Rangoon.

There are 100 boats, representing about 210 tons, and there are always sufficient boatmen to man 65 boats.

Labour is plentiful and cheap, and the cost of working cargo is about 5 Annas a ton.

Landing and shipping is expensive, and costs through a European agent about 3 Rupees a ton. The native agents contract at about $1\frac{1}{2}$ Rupees a ton.

There is a Port Conservator, who is also Superintendent of Sea Customs.

Fresh water can always be obtained at the rate of 2 Rupees per 300 gallons. Provisions can also be procured, but in very small quantities.

The bad weather months are April, May, October, and November.

Satara Reef, having 21 feet on its northern or shoalest part, is situated about $\frac{3}{4}$ of a mile from the beach, with the Lighthouse bearing *S.W. ½ W.* and the Port Flagstaff *N.W. ¼ N.* The reef is steep to, with 7 fathoms close to on its northern and eastern edges.

Agra Rock, so called after the B.I. steamer that was lost here in 1887, is about a mile from the shore. There is a depth of 19 feet on the patch, and the sea is not discoloured and rarely breaks on it.

Kandivalasa Peak, open southward of Rámachandrapur Hill *W.N.W.*, leads to the southward of the patch. The latter hill is about a mile inland and is 538 feet high, surmounted by a beacon 15 feet high.

The **Santapilly Rocks** are situated in Latitude $18^{\circ} 0' 20''$ *N.*, Longitude $83^{\circ} 42' 25''$ *E.*, and are about $5\frac{1}{2}$ miles from the shore.

The least water on the rocks is 7 feet with 8 to 10 fathoms close to all round.

In the monsoon the sea breaks heavily on the reef, and it can easily be distinguished 4 or 5 miles away. In the fine weather, however, when the sea is smooth, the sea does not break, nor does it present a discoloured appearance.

Santapilly Lighthouse, in line with Kandivalasa Peak, *N.W.* $\frac{1}{2}$ *N.*, leads $1\frac{1}{4}$ miles southward of the rocks; and the summit of an isolated, bare, red, double peaked hill, $1\frac{1}{2}$ miles *N.N.E.* of the lighthouse, and 384 feet high, in line with Kandivalasa Hill *N.W.* by *W.* $\frac{1}{8}$ *W.*, leads 2 miles northward of them.

The channel between the rocks and the mainland is perfectly safe, it is about 4 miles wide, with regular soundings from $9\frac{1}{2}$ fathoms a quarter of a mile from the rocks to 5 fathoms three quarters of a mile from the beach, and is often used by the coasting steamers.

The **Santapilly Light**, in Latitude $18^{\circ} 04' 56''$ *N.*, Longitude $83^{\circ} 37' 35''$ *E.*, is situated on a small detached hill some distance inland and about three quarters of a mile from the beach.

It is a fixed, white light of the 2nd order, and was improved last in 1888; it stands 164 feet above high water level, and is visible seaward from *N.E.* through *W.* to *S.W.* and can be seen 16 miles in clear weather.

The lighthouse is built of stone, and is painted white. There is also a small building on its west side.

The nearest town on the coast is **Konada**, where there is a large salt factory. It may be recognised by several large white buildings on the low ground. There are no dangers in its vicinity, and anchorage may be obtained as convenient off the mouth of the small river.

Gopalpur.

Ganjam District.

Between sunrise and 8 p.m.

| | | Rs. | As. | P. |
|---|----------|-----|-----|----|
| Accommodation boat | per trip | 2 | 0 | 0 |
| Do. return trip from same vessel | | 1 | 0 | 0 |
| Do. „ „ different vessel | | 2 | 0 | 0 |
| Cargo boat | per trip | 1 | 0 | 0 |
| Do. return trip from same vessel | | 0 | 12 | 0 |
| Do. „ „ different vessel | | 1 | 0 | 0 |
| Catamarans | per trip | 0 | 5 | 0 |
| Water boat | „ | * 2 | 0 | 0 |
| Cargo boat for landing horses | „ | 2 | 0 | 0 |
| For boats employed in landing carriage— | | | | |
| If one boat is used | „ | 3 | 0 | 0 |
| If two boats are required, then for each boat | „ | 2 | 8 | 0 |
| Transhipping cargo— | | | | |
| For first trip, in addition to ordinary hire | | 1 | 0 | 0 |
| For each succeeding trip | per day | 0 | 12 | 0 |

Extraordinary rates.

Between 8 P.M. and 4 A.M. provided the boat leaves the shore after 8 P.M., per trip Double the ordinary rates.

Between 4 A.M. and sunrise, per trip An ordinary rate and a half.

During the period that either the surf or the current flag may be hoisted, and on all occasions when a boat carries a double crew by direction of the Port Officer Double the ordinary rates.

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the District.

A double crew shall consist of 10 men and 2 boys. The surf or current flag shall be hoisted only when the Port Officer considers a double crew necessary.

* This charge includes cost of filling casks, providing ropes, buckets, etc.

Ganjam.

Ganjam District.

Between sunrise and 8 p.m.

| | | Rs. | As. | P. |
|--|----------|-----|-----|----|
| Catamaran | per trip | 0 | 8 | 0 |
| Boats carrying 1 ton or less | „ | 1 | 0 | 0 |
| Do. 1 to 2 tons | „ | 1 | 8 | 0 |
| Do. 2 to 4 „ | „ | 2 | 0 | 0 |

| | | Rs. | As. | P. |
|-----------------------|----------|-----|-----|----|
| Boats carrying 4 to 6 | per trip | 3 | 0 | 0 |
| Do. 6 to 8 | „ | 4 | 0 | 0 |
| Do. 8 to 10 | „ | 5 | 0 | 0 |
| Do. over 10 | „ | 5 | 0 | 0 |

Plus 1 Rupee for every 5 tons or fraction thereof in excess of 10 tons.

| | |
|------------------------------|------------------------|
| Return trip from same vessel | Half rate extra. |
| Do. different vessel | Two-thirds rate extra. |

Extraordinary rates.

| | |
|--|------------------------------|
| Between 8 p.m. and 4 a.m., provided the boat leaves the shore after 8 p.m., per trip | Double the ordinary rates. |
| Between 4 a.m. and sunrise, per trip | An ordinary rate and a half. |
| During the period that either the surf or the current flag may be hoisted, and on all occasions when a boat carries a double crew by direction of the Port Officer | Double the ordinary rates. |

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, and detention caused by the state of the weather, tide and other unforeseen obstructions, the Port Officer or other officer in charge of the port shall, with the sanction of the Collector, adjudge and allow such additional hire as the circumstances of the case may seem to warrant.

A double crew shall consist of 10 men and 2 boys in the case of large masulah boats, and 8 men and 2 boys in the case of small masulah boats.

The surf or current flag shall be hoisted only when the Port Officer considers a double crew necessary.

Sonapur, Baruva, Pundi, Bapanapadu, and Calingapatam.

Ganjam District.

Between sunrise and 8 p.m.

| | | Rs. | As. | P. |
|---|----------|-----|-----|----|
| Accommodation boat | per trip | 2 | 0 | 0 |
| Do. return trip from same vessel | | 1 | 0 | 0 |
| Do. „ „ different vessel | | 2 | 0 | 0 |
| Cargo boat | per trip | 1 | 0 | 0 |
| Do. return trip from same vessel | | 0 | 12 | 0 |
| Do. „ „ different vessel | | 1 | 0 | 0 |
| Catamarans | per trip | 0 | 5 | 0 |
| Water boat | „ | 3 | 8 | 0 |
| Cargo boat for landing horses | „ | 2 | 0 | 0 |
| For boats employed in landing carriage— | | | | |
| If one boat is used | „ | 3 | 0 | 0 |
| If two boats are required, then for each boat | „ | 2 | 8 | 0 |
| Transshipping cargo— | | | | |
| For first trip, in addition to ordinary hire | „ | 1 | 0 | 0 |
| For each succeeding trip | per day | 0 | 12 | 0 |

Extraordinary rates.

| | |
|--|------------------------------|
| Between 8 P.M. and 4 A.M., provided the boat leaves the shore after 8 P.M., per trip | Double the ordinary rates. |
| Between 4 A.M. and sunrise, per trip | An ordinary rate and a half. |
| During the period that either the surf or the current flag may be hoisted, and on all occasions when a boat carries a double crew by direction of the Port Officer | Double the ordinary rate. |

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Bimlipatam derives its name from Bhima, one of the Pandu princes, who is believed to have founded the town. It was ceded to the East India Company by the Dutch in 1825, and from that date until 1846 was merely a fishing village. In that year, however, the trade begun to improve, and it is now a regular port of call for the coasting steamers belonging to the Asiatic and B.I.S.N. Co. Many steamers, principally those of the Clan Line, load direct for Europe.

The trade has increased three fold within the last 40 years, and a concession has been obtained from Government to build a light railway into the interior, which will no doubt still further develop the trade of the port.

The best anchorage is with the flagstaff, bearing *S. 73° W.* magnetic in $4\frac{1}{2}$ to 5 fathoms, sand and mud, and good holding ground. In the S.W. monsoon it is better to anchor a little further to the northward, in not less than 5 fathoms.

When coasting, the bold headlands known as Upada Bluffs prevent the town from being seen until close up to the anchorage, and from the northward the best landmark is Annam Hill, 830 feet high, and flat and quite bare on the top.

A large temple, painted white, on the slope of the hill behind the town, is very conspicuous and the top of the same hill is surmounted by an obelisk 16 feet high, the hill itself being 531 feet above sea level.

The temple is always brightly illuminated every Saturday from sunset to midnight, and the lights can be seen many miles.

Another conspicuous object from seaward is the tall chimney of a gunny factory at Chitavalasa, belonging to Messrs. Arbuthnot & Company.

It is high water, full and change, at 8 hours 53 minutes, and the spring tides rise $5\frac{1}{2}$ feet, neaps rise $3\frac{1}{2}$ feet.

The principal exports are gingelly and niger seeds, indigo, myrabolams, hides, horns, and gunny bags, valued at 4,000,000 Rupees.

The imports are raw jute, cotton twist, piecegoods, machinery, and European stores and liquors, valued at 2,000,000 Rupees.

There are 60 masulah boats belonging to the port, with a total capacity of 130 tons, and there are always sufficient boatmen to man 40 boats.

Labour is abundant and inexpensive. The cost of working cargo is $3\frac{1}{2}$ to 4 Annas a ton, and landing and shipping cost from 12 Annas to 1 Rupee 8 Annas a ton, according to the season and the nature of the cargo.

The port is under the charge of a Port Officer, who has Magisterial powers.

There is considerable native [passenger traffic with Rangoon, to and from which place and Madras there is a regular coasting service.

Fresh water can be obtained, and fresh provisions are good, plentiful, and very cheap.

There is a very good hospital, where both European seamen and lascars are admitted.

The weather is uncertain in April and May, October and November, as at all other ports in this district.

Between this port and Waltair a round topped hill, 490 feet high, with an obelisk on its summit, is a conspicuous land-mark. It is known as **Sugar Loaf Hill**, and is about midway between Bimlipatam and the anchorage off Vizagapatam.

Vizagapatam, or Viśakha-patnam or city of Viśakha, the Hindu Mars, is in Latitude $17^{\circ} 41' 45'' N.$, Longitude $83^{\circ} 17' 15'' E.$

In giving a description of Vizagapatam and its charming suburb Waltair, too much cannot be said of the grandeur of the natural features by which it is distinguished.

The scenery is beautiful and the buildings on the hill are very picturesque.

The town is situated in a small bay, the southern extremity of which is bounded by a promontory known as the Dolphin's Nose, and its northern extremity by the suburb of Waltair, where most of the

Europeans reside. To the west lies a large swamp, which has been partially reclaimed. The town is separated from the Dolphin's Nose by the river, which forms a bar where it enters the sea, and 50 years ago it was passable for vessels of from 300 to 500 tons during spring tides; it is now, however, only capable of admitting boats and small steam launches.

It is proposed to improve the harbour by dredging the river and the bar, and by the erection of two substantial breakwaters, somewhat similar to those at Madras. For this purpose Mr. Thorogood was deputed by the Government of India to survey the harbour, and report on its capabilities. His scheme was eventually accepted and approved by the Government of India, on the understanding that the cost was to be borne by the Local Government. The scheme has many influential supporters, and it is hoped that before long the harbour will be an accomplished fact.

It will be an immense boon, as there is no safe harbour between Calcutta and Trincomalee, and should the Admiralty take it up, it would become an important naval and coaling station; and now the port is in direct communication with every part of India, it will be the easiest and shortest route to Burma for mails and passengers or troops.

The history of Vizagapatam is interesting, and is briefly as follows:—

According to tradition it was founded by an Andra king, named Coolotonga, about the middle of the 12th century, and its ancient name was Tirthapurallu, meaning rock and holy waters.

With the rest of the Kalinga country it fell into the hands of the Mussalman invader, and formed part of the Chicacole Sircar.

The Dutch first appeared upon the scene in the early part of the 17th century, as the tombstones in the old Dutch cemetery will testify.

The English established a factory here in 1687, but it was seized by the orders of the Mughal on 13th September, 1689, and all the English Officers were murdered. The factory, however, was renewed the following year, when the rupture between the Company and Aurungzeb had been healed, and in 1692 the Emperor allowed the English to fortify their position. Some of the Public Offices are now built on the site of the old fort.

The fort was attacked without success by a local Nawab named

Fakir Khan, in November 1710, and in 1716 the Emperor issued a firman, confirming the possession of the British settlement.

In the early part of the 18th century Jaffer Ali and his Mahratta mercenaries harried the whole country side, and sacked Bimlipatam, but did not touch the fort at Vizagapatam.

In 1757 Bussy took the town, when the Maharajah of Vizianagram came to our assistance, and took it from the French. It was restored to the English on the 12th September, 1758. On the top of the hill, close to the suburb of Waltair, a large tomb may be found, almost hidden under a tree, which contains the remains of the French soldiers that fell in 1757.

Vizagapatam was finally ceded to the English by the Nizam, together with the rest of the Northern Circars, in February, 1768.

The town owes much to Sri Rajah Gajapati Row, C.I.E., and the whole Goday family, who have always been foremost in assisting every good object for a number of years.

On the Dolphin's Nose the remains of an old battery and castle may be found, to the east of which there is a large cave.

On the hill overlooking the harbour are the temple of Venkateshwaran, a mosque, two Mussalman tombs, and a large Roman Catholic Church.

A celebrated Muhammedan saint is buried in the mosque, and in the old days every vessel passing the port used to salute the tomb, the saint being considered all-powerful over the elements in the Bay of Bengal; and even at the present day, a devotee of the mosque boards every steamer and presents the officers and crew with a small piece of sweet smelling herb, which is supposed to protect the wearer from the dangers of the sea.

Wealthy Hindoo shipowners used to present handsome silver dhonies at his shrine, after their ships had made a successful voyage.

As a seaport Vizagapatam has many natural advantages, and the trade is gradually increasing year by year.

The coasting trade is in the hands of the B.I.S.N. Co., and the Asiatic Steamers also call here fortnightly. Many steamers, principally belonging to the Clan Line, load here direct for the United Kingdom and the Continent. There is also a large native passenger traffic with Rangoon.

The special industries of the town are cloth weaving, and ornamental articles made of buffalo and deer horn, ivory, silver, porcupine quills and sandalwood.

The best anchorage is close under the Dolphin's Nose headland, in about 30 feet of water, with the river mouth open on the following bearings:—

| | | |
|--------------------------|---------------------------|-------------|
| Port Flagstaff | N. 68° W. | } Magnetic. |
| Dolphin's Nose Flagstaff | S. 45° W. | |
| or Fort Flagstaff | W. by N. $\frac{3}{4}$ N. | } Magnetic. |
| Mosque | W. $\frac{1}{4}$ N. | |
| Dolphin's Nose Flagstaff | S. W. $\frac{1}{4}$ S. | |

It is proposed to erect a new port light in the near future. A large red buoy is laid down in 30 feet lowest spring tides $\frac{4}{10}$ ths of a mile to the eastward of the old Dutch fort, and can be used for stern moorings.

It is high water, full and change of the moon, at 9 hours 3 minutes, spring tides rise 6 feet, and neap tides about $3\frac{1}{2}$ feet.

The principal exports are jaggery, hides and skins, turmeric, myrabolams, and manganese ore, valued at 4,000,000 Rupees.

The imports are European stores, Government stores, the usual bazaar cargo, and railway material, valued at 2,665,000 Rupees.

The manganese ore trade has rapidly increased of late years, and during 1896, 42,000 tons were exported to Europe and the United States.

The facilities for working cargo have been much improved, and the quays have been extended along the river bank, on which two Government cranes are placed for lifting heavy weights and awkward cargo.

The East Coast Railway authorities have also constructed their lines and buildings so as to work in with the proposed harbour works. A treble line is laid down to the beach to enable the jaggery and manganese ore to be put straight into the boats from the trucks.

Both town and port have been fortunate in having such a neighbour as the late Maharajah of Vizianagram, who always assisted both with his purse and his good will.

In addition to about 90 masulah boats, Messrs. Stuart Hall & Co. have over 30 large boats for landing railway material. The total capacity is about 800 tons.

Boatmen and stevedore's labourers are abundant and experienced.

The cost of working cargo is from 3 to 6 Annas a ton.

Landing and shipping costs from 12 Annas to 1½ Rupees, according to the season and the nature of the cargo handled. Railway material costs 2 Rupees a ton to land.

The port is under the charge of a Port Officer, who is also a 1st class Magistrate.

Fresh water can be obtained, but not good, and costs about 3 Rupees per 400 gallons alongside.

Stores and provisions can be obtained at reasonable rates, and coal can be procured from the Railway Company.

Any castings or repairs to machinery can be executed at the railway workshops, which are under European supervision.

There is a large hospital and civil dispensary, where European seamen and lascars can be admitted.

The weather is uncertain during April, May, October and November, when cyclones may be experienced, and the work is occasionally delayed during June and July.

Kutkonda is a small conspicuous bluff about 10 miles south of Vizagapatam. It is 145 feet high, and is surmounted by a beacon 16 feet high.

Between Vizagapatam and Cocanada there are two small ports **Pudi**, or Pudimadaka, and **Pentakota**, but as they have been entirely abandoned for more than 20 years they call for no further mention here.

The coast is very conspicuous at night, and coasting steamers, specially those bound to the northward, should always keep well in to the coast, and the 10 fathom line is only about 3 miles off the coast.

Bimlipatam.

Vizagapatam District.

Between sunrise and 8 p.m.

| | | Rs. | As. | P. |
|--|----------|-----|-----|----|
| Accommodation boat | per trip | 2 | 4 | 0 |
| Do. return trip from same vessel | | 1 | 2 | 0 |
| Do. „ „ different vessel | | 2 | 4 | 0 |
| Cargo boat | per trip | 1 | 8 | 4 |
| Do. return trip from same vessel | | 1 | 0 | 0 |
| Do. „ „ different vessel | | 1 | 8 | 0 |
| Water boat, holding 2 tons | per trip | *3 | 8 | 0 |

* This charge includes cost of filling casks, providing ropes, buckets, etc.

| | | Rs. | As. | P. |
|--|----------|-----|-----|----|
| Cargo boat for landing horses | per trip | 2 | 0 | 0 |
| For boats employed in landing a carriage— | | | | |
| If one boat is used | „ | 3 | 0 | 0 |
| If two boats are required, then for each boat | „ | 2 | 0 | 0 |
| <i>Transshipping.</i> | | | | |
| For the first trip, in addition to the ordinary charge | „ | 1 | 8 | 0 |
| For each succeeding trip | per day | 1 | 2 | 0 |
| Catamarans | | 0 | 5 | 0 |

Extraordinary Rates.

Between 8 P.M. and 4 A.M., provided the boat leaves the

shore after 8 P.M., per trip Double rates.

Between 4 A.M. and sunrise, per trip An ordinary fare and a half.

When a double crew is considered necessary by the Port

Officer, per trip Double rates.

When surf or current flag is hoisted, per trip „

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Vizagapatam.

Vizagapatam District.

Between sunrise and 8 p.m.

| | | Rs. | As. | P. |
|---|----------|-----|-----|----|
| Accommodation boat | per trip | 2 | 4 | 0 |
| Do. return trip from same vessel | | 1 | 2 | 0 |
| Do. „ „ different vessel | | 2 | 4 | 0 |
| Cargo boat | per trip | 1 | 8 | 0 |
| Do. return trip from same vessel | | 1 | 8 | 0 |
| Do. „ „ different vessel | | 1 | 0 | 0 |
| Water trip holding 2 tons | per trip | *3 | 8 | 0 |
| Cargo boat for landing horses | „ | 2 | 0 | 0 |
| For boats employed in landing a carriage— | | | | |
| If one boat is used | „ | 3 | 0 | 0 |
| If two boats are required, then for each boat | „ | 2 | 8 | 0 |

Transshipping.

| | | | | |
|--|----------|---|---|---|
| For the first trip, in addition to the ordinary charge | per trip | 1 | 8 | 0 |
| For each succeeding trip | per day | 1 | 2 | 2 |
| Catamarans | per trip | 0 | 5 | 0 |

Canoes.

| | | | | |
|--|-------------|---|---|---|
| For passage from any part of the backwater to any other part of the same | each person | 0 | 0 | 2 |
|--|-------------|---|---|---|

* This charge includes filling caaks, providing ropes, buckets, etc.

| | Rs. | As. | P. |
|---|-----|-----|----|
| For passage from any part of the backwater to any other part of the same | | | |
| with either a bundle or baggage | 0 | 0 | 3 |
| A load of cargo per trip | 0 | 8 | 0 |
| <i>Note.</i> —Canoes cannot be used to convey passengers or cargo beyond the limits of the backwater. | | | |

Extraordinary Rates.

| | |
|--|------------------------------|
| Between 8 P.M. and 4 A.M., provided the boat leaves the shore after 8 P.M., per trip | Double rates. |
| Between 4 A.M. and sunrise, per trip | An ordinary fare and a half. |
| When a double crew is considered necessary by the Port Officer, per trip | Double rates. |
| When surf or current flag is hoisted, per trip | Do. |

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Pudimadaka and Pentakota.

Vizagapatam District.

Between sunrise and 8 p.m.

| | Rs. | As. | P. |
|---|-----|-----|----|
| Accommodation boat per trip | 2 | 4 | 0 |
| Do. return trip from same vessel | 1 | 2 | 0 |
| Do. " " different vessel | 2 | 4 | 0 |
| Cargo boat per trip | 1 | 8 | 0 |
| Do. return trip from same vessel | 1 | 0 | 0 |
| Do. " " different vessel | 1 | 8 | 0 |
| Water boat holding 2 tons per trip | *3 | 8 | 0 |
| Cargo boat for landing horses " | 2 | 0 | 0 |
| For boats employed in landing a carriage— | | | |
| If one boat is used " | 3 | 0 | 0 |
| If two boats are required, then for each boat " | 2 | 8 | 0 |
| For boats employed in landing or receiving cargo behind the surf at Pudimadaka per trip | 0 | 8 | 0 |

Transshipping.

| | | | |
|---|---|---|---|
| For the first trip, in addition to the ordinary charge per trip | 1 | 8 | 0 |
| For each succeeding trip per day | 1 | 2 | 0 |
| Catamarans per trip | 0 | 5 | 0 |

Extraordinary Rates.

| | |
|--|------------------------------|
| Between 8 P.M. and 4 A.M., provided the boat leaves the shore after 8 P.M., per trip | Double rates. |
| Between 4 A.M. and sunrise, per trip | An ordinary fare and a half. |

* This charge includes filling casks, providing ropes, buckets, etc.

When a double crew is considered necessary by the Port Officer,
 per trip Double rates.
 When surf or current flag is hoisted, per trip Do.

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Cocanada, "Kaki-nada," or "Crow-country," is the second seaport of the Presidency after Madras, and the roadstead is the safest on this coast, but the anchorage is gradually shifting owing to the silting up of the bay. It is situated about 545 miles south of Calcutta, and about 320 miles north of Madras, in Latitude $16^{\circ} 56' 30''$ N., Longitude $82^{\circ} 14' 30''$ E., and at the last census had a population of over 40,000.

It is connected by navigable canals with Samulkotta and the Godaveri River, at Dowlaiswaram, and is about $5\frac{1}{2}$ miles from the anchorage. It is also connected with all the principal places in India by the East Coast Railway, and has also communication with Madras via Bezwada.

Being the head-quarters of the Godaveri District, it contains the court of the Collector and Magistrate, jail, hospital, Post and Telegraph Offices, and the Port and Sea Customs Offices.

There is a large European mercantile community, and most of the foreign Governments are represented by consular agencies.

Shipping of about 900,000 tons burthen enter the port annually.

There are extensive quays, opposite the merchants' offices, the entire length of the tidal creek, and greatly improved facilities for working cargo.

Two long groynes have been erected at the mouth of the river, which have had to be extended from time to time on account of the silt.

Dredging machines are constantly at work on the bar to keep the passage free for the large boats and steam launches, some of which are over 60 tons burthen.

Boats and rafts capable of landing heavy weights can always be obtained, and there is a steam crane capable of lifting 12 tons, besides several smaller ones.

Small repairs and castings can be done at the railway and local workshops.

The best anchorage is with Vakalapudi Lighthouse bearing *N.W.* $\frac{1}{4}$ *N.* to *N.W.* $\frac{1}{2}$ *W.* magnetic, and the old Lighthouse at Cocanada

To face page 73.

Vakalapudi Light has been altered from a flashing white to a group flashing light, showing three flashes in quick succession, every 10 seconds.

S.W. $\frac{3}{4}$ W. magnetic in 4 to 5 fathoms in soft mud and good holding ground.

The anchorage is gradually shifting owing to silt.

Where the survey of 1891 shows 5 to 6 fathoms there was in 1899 from $\frac{1}{2}$ to $\frac{3}{4}$ fathoms, and less than that in places.

It is high water, full and change of the moon, at 8 hours 50 minutes, and the spring tides rise 5·3 feet, neaps rise 3½ feet.

The principal exports are jaggery, cotton, gingelly seed, castor seed, castor oil, tobacco, and rice, valued at 15,000,000 Rupees.

The principal imports are iron, copper, railway material, gunny bags, sugar, European stores and liquors, and Government stores, valued at 4,000,000 Rupees.

It has been proposed to construct a canal from Cocanada to Vakalapudi and to make the port there. This scheme was originally proposed by Captain Wicks, the present Port Officer, and has received considerable support, and has been favourably reported on by Mr. J. Bell, one of the first Engineers in India. There is no doubt that it would be of very great advantage to the shipping, as the new port would be close to, and immediately opposite the anchorage. The cost of such works, though considerable, is not prohibitive, and it is certain that if Cocanada is to retain its position as the second largest port in the Madras Presidency, something must be done, as the present arrangements, though very costly, are quite inadequate to the demands of the already increasing trade, which has been given a great impetus since the East Coast Railway has been established.

The Vakalapudi Lighthouse, in Latitude $17^{\circ} 0' 40''$ N., Longitude $82^{\circ} 16' 30''$ E., is situated $4\frac{3}{4}$ miles north of Cocanada River, and is about 500 yards from the beach.

It is a revolving, white, dioptric light of the 4th order with a single flash of 20 seconds duration, illuminating an arc of 360° , standing 80 feet above high water level and visible in clear weather 14 miles.

The lighthouse is built of stone and is painted white, and is intended as a guide to vessels approaching the anchorage.

There are also 2 red fixed lights on wooden posts on the ends of the north and south groynes at the entrance to the river, to guide the boats in and out, and they are visible in clear weather $2\frac{1}{2}$ to 3 miles. The signal station is at the Vakalapudi Lighthouse, and is connected by telephone with the Port Office. Weather signals are displayed here daily.

A large pillar buoy, painted black, is moored in $7\frac{1}{2}$ fathoms of water off Godaveri Point, with Vakalapudi Lighthouse bearing *N.W.* by *W.* $\frac{1}{2}$ *W.*, and its approximate position is Latitude $16^{\circ} 57' 15''$ *N.*, Longitude $82^{\circ} 22' 45''$ *E.*

This buoy has had to be shifted further out several times during the last few years, as the sand spit at Godaveri Point continues to grow.

It is proposed to light this buoy by gas, which would be a great boon to shipmasters.

There is a beacon surmounted by a pole with a basket, 28 feet high, on the sandy point of Godaveri.

The port is under the charge of a Port Officer, who is also Registrar of Shipping and Shipping Master. He is also Conservator of the Port under the Harbour Board, and is in charge of the groyne extensions and various port improvements.

There is a large, though decreasing trade, carried on by native brigs and barques round the coast and to the timber ports in Burma, and there are still a few European sailing vessels trading to Mauritius and elsewhere.

There are 100 boats belonging to the port, representing about 3,500 tons, and 5 steam launches, 2 the property of the Government, and 3 belonging to Stuart Hall & Co., the agents for the B.I.S.N. Co.

There are always about 500 boatmen available, and labour is both abundant and cheap.

The cost of working cargo is from $2\frac{1}{2}$ to 5 Annas a ton, and landing and shipping costs about $7\frac{1}{2}$ Annas a ton ; it is the cheapest port on the coast.

Fresh water is obtainable, but not very good, it is put alongside in large tanks, but steamers must use their own pumps. Stores and provisions are plentiful and fairly cheap.

Coal can be obtained in any quantity.

There is a good hospital, where European seamen are admitted on application.

The weather is uncertain during April, May, October and November, when cyclones of severe intensity may be experienced, but although the roads are exposed to easterly winds vessels need never put to sea on the approach of bad weather, and in the event of being driven ashore the very soft muddy bottom prevents any serious damage being done.

To face page 75.

The temporary fixed red light at Sacramento has been replaced by a flashing white light every five seconds, elevated 140 feet above high water and visible 18 miles in clear weather, and the Hope Island Light will be discontinued about 27th July, 1902.

There is a large native passenger trade with Rangoon, and many thousands of natives are annually carried backwards and forwards by the mail steamers belonging to the British India Company.

From the northward the anchorage is quite safe to approach, with the Vakalapudi Light bearing *W.S.W.* From the southward great care is necessary, the lead should be kept going, and in rounding the coast between Sacramento Shoal and Godaveri Point it is advisable to keep in at least 12 fathoms of water, or about 3 miles from the coast, and the anchorage should not be steered for until the Vakalapudi Light bears to the westward of *W. by N.*

Hope Island Lighthouse, in Latitude $16^{\circ} 49' 05''$ *N.*, Longitude $82^{\circ} 18' 58''$ *E.*, is situated on the southern part of Hope Island, about $2\frac{1}{2}$ miles from the sea.

It is a fixed, white, dioptric light of the 4th order, standing 83 feet above high water level, and is visible from *N. 5^{\circ} E.*, through *W. to S. 5^{\circ} W.*, and can be seen 14 miles in clear weather.

The Lighthouse is built of masonry, and is painted in horizontal, alternate bands of black and white. It is intended to guide vessels round this dangerous part of the coast, but in bad weather too much dependence should not be placed in this light as it is sometimes obscured by miasma and by the swarms of insects that hover round it.

On this part of the coast distances judged by the eye are generally erroneous, owing to the sand haze. The only marks between Godaveri Point and the Sacramento Shoal are a white obelisk, 32 feet high, near a village and the Baheraswami Temple.

There is a temporary light in Latitude $16^{\circ} 34' 40''$ *N.*, Longitude $82^{\circ} 16' 30''$ *E.*, called the Sacramento Shoal Light, situated on the sandbanks half a mile inland from the beach, and near the Kotapalum Beacon.

It is a fixed, red, dioptric light of the 4th order, illuminating an arc of 180° from *N. 45^{\circ} E.* through *W. to S. 45^{\circ} W.* It is erected on a temporary wooden structure with a thatched roof, and was first shown in October, 1895.

A new Lighthouse is under construction close to the temporary structure, which will be known as Sacramento Light.

The new light will be an 18-mile group flashing light of the 2nd order, and will probably be exhibited before 1903.

When this light is exhibited, both the present temporary light

and Hope Island Light will be discontinued, but the Lighthouse Tower will remain as a day mark.

There is another beacon at the mouth of the Bandarmalanka River with a pole 26 feet high, about 22 miles *W.S.W.* from the Sacramento Shoal Light.

Narsapur Point may be distinguished by the obelisk 80 feet high on the eastern shore of the river of that name.

The Point is in Latitude $16^{\circ} 17' 30''$ N., Longitude $81^{\circ} 42' 30''$ E. It was once a flourishing port, but is now nearly cut off from the sea by the extension of the Godaveri Delta.

In the 17th century the English occupied a suburb called Madhavapalayam, whence the trade name Madapolam. Boats are still built and repaired here, but there is no trade. It is visited once a year by thousands of pilgrims at the time of the festival at the Hindu shrine.

Cocanada.

Godavari District.

Export Cargo.

| ARTICLES. | PACKAGES. | NET-WEIGHT. | RATE. | | | PER. |
|--------------------------------|-----------|-------------|-------|-----|----|----------|
| | | | RS. | AS. | P. | |
| Rice | Bags | 164 lbs. | 3 | 0 | 0 | 100 bags |
| Gram (all kinds) | " | 164 " | 3 | 0 | 0 | " |
| Wheat | " | 164 " | 3 | 0 | 0 | " |
| Grains not otherwise specified | " | 164 " | 3 | 0 | 0 | " |
| Salt | " | 164 " | 3 | 0 | 0 | " |
| Refined sugar | " | 168 " | 3 | 0 | 0 | " |
| Betel-nuts | " | 164 " | 3 | 0 | 0 | " |
| Fenugreek seed | " | 164 " | 3 | 0 | 0 | " |
| Crushed bones | " | 164 " | 3 | 0 | 0 | " |
| Nux vomica | " | 164 " | 3 | 0 | 0 | " |
| Poonac | " | 164 " | 3 | 0 | 0 | " |
| Cholum | " | 164 " | 3 | 0 | 0 | " |
| Bagi | " | 164 " | 3 | 0 | 0 | " |
| Cumbu | " | 164 " | 3 | 0 | 0 | " |
| Paddy | " | 164 " | 3 | 4 | 0 | " |
| Gingelly seed | " | 164 " | 3 | 4 | 0 | " |
| Castor seed | " | 164 " | 3 | 4 | 0 | " |
| Rape seed | " | 164 " | 3 | 4 | 0 | " |
| Mustard seed | " | 164 " | 3 | 4 | 0 | " |
| Jaggery | " | 164 " | 3 | 0 | 0 | " |
| Turmeric | " | 164 " | 3 | 4 | 0 | " |
| Coriander seed | " | 161 " | 5 | 0 | 0 | " |
| Cassia bark | " | 82 " | 3 | 0 | 0 | " |

| ARTICLES. | PACKAGES. | NET-WEIGHT. | RATE. | | | PER. |
|-----------------------------------|-----------|-----------------|-------|-----|----|-------------|
| | | | Rs. | As. | P. | |
| Cassia bark | Bags | 164 lbs. | 5 | 0 | 0 | 100 bags |
| Bones | " | 82 " | 3 | 0 | 0 | " |
| Garlic | " | 164 " | 4 | 8 | 0 | " |
| Myrabolams | " | 164 " | 3 | 0 | 0 | " |
| Cotton | Bales | 300 " | 8 | 0 | 0 | 100 bales |
| Do. | " | 400 " | 10 | 0 | 0 | " |
| Hemp | " | 400 " | 10 | 0 | 0 | " |
| Coir yarns | " | 252 " | 8 | 0 | 0 | " |
| Jute | " | 400 " | 10 | 0 | 0 | " |
| Chillies | " | 300 to 400 lbs. | 12 | 8 | 0 | " |
| Gunnies | " | 300 to 400 " | 12 | 8 | 0 | " |
| Twist | " | — | 12 | 8 | 0 | " |
| Piece-goods | " | — | 12 | 8 | 0 | " |
| Raw skins and hides | " | 400 to 700 " | 0 | 6 | 0 | Bale |
| Tanned hides and skins | " | 400 lbs. | 0 | 4 | 0 | " |
| Tobacco | " | 250 " | 12 | 8 | 0 | 100 bales |
| Castor oil | Cases | 172 " | 6 | 4 | 0 | 100 cases |
| Ghee | " | 160 " | 6 | 4 | 0 | " |
| Tin plates | " | 112 " | 3 | 0 | 0 | " |
| Cement | Casks | 300 to 450 lbs. | 0 | 2 | 0 | Cask |
| Castor oil | " | 625 lbs. | 0 | 4 | 0 | " |
| Ghee | " | 625 " | 0 | 4 | 0 | " |
| Molasses | " | 700 " | 0 | 4 | 0 | " |
| Cocoanuts | Bundles | 150 to 210 lbs. | 8 | 0 | 0 | 100 bundles |
| Copra | " | 164 lbs. | 5 | 0 | 0 | " |
| Horns | " | 164 " | 0 | 2 | 0 | Bundle |
| Do. loose | Loose | — | 0 | 2 | 0 | 100 horns |
| All other goods in bags | Bags | 164 " | 3 | 4 | 0 | 100 bags |
| Do. do. bales | Bales | — | 10 | 0 | 0 | 100 bales |

To or from Coringa, Talravo, or Nilapilly, 4, 8 and 12 Annas, respectively, in excess of the above charges per 100 bags.

| | | | | |
|--|---|-----|-----|----|
| From Coringa to Talravo or Nilapilly per every 100 bags, and <i>vice versa</i> , | { | Rs. | As. | P. |
| respectively | | 1 | 6 | 0 |
| | | and | | |
| | | 1 | 12 | 0 |
| From Nilapilly, Talravo, or Coringa to a vessel on the Coringa Bar or | { | 2 | 12 | 0 |
| above it, and <i>vice versa</i> , per 100 bags, respectively | | 1 | 8 | 0 |
| | | 1 | 4 | 0 |
| From a godown to a vessel opposite to or near it, per 100 bags | | 0 | 12 | 0 |

Import Cargo.

(Import Cargo will be paid for at the rate of 7½ Annas per ton of register tonnage.)

Demurrage for the detention of a cargo boat alongside of a vessel in the roads or in any of the rivers, for each day beyond three, for every 100 bags the boat is licensed to carry 0 12 0

Return trips, half the above charges if from the same vessel. If from another vessel, full hire.

Transshipping cargo from one vessel to another, per trip, half the rate from shore to ship.

The bag is calculated at two Bengal maunds, or 164 lbs. each.

Accommodation Boats.

| | Ra. | As. | P. |
|---|-----|-----|----|
| 1st class, per trip from Cocanada to the roads | 4 | 0 | 0 |
| 2nd class, do. do. do. | 3 | 0 | 0 |
| 3rd class, do. do. do. | 2 | 0 | 0 |
| If detained alongside of the vessel above three hours, for every hour extra . | 0 | 12 | 0 |
| First class accommodation boats from Nilapilly to Cocanada or to a vessel in Cocanada roads and <i>vice versa</i> , if not exceeding one day | 7 | 0 | 0 |
| Do. do. do. Talravo | 6 | 0 | 0 |
| Do. do. do. Coringa | 5 | 0 | 0 |

In excess of one day, per diem half of the above charges extra to be made.

Extra hire to all vessels in more than 5 fathoms in the south-west monsoon, or 6 fathoms in the north-east, one-third the above hire for all classes of boats.

Masulipatam, "Machli-patnam" or "Fish Town." According to Colonel Yule, it is the **Mæsolia** of the Greek geographers, and he believes the name to be a relic of that word.

It is still the principal port of the Kistna District, though it has few natural advantages, and suffers in addition from competition with Cocanada.

The port was probably founded by the Arabs in the 14th century. In 1425 a Muhammedan mosque was built in the town, and the Bahmini king Mahammed II. entered Masulipatam in 1478.

But it was under the Golconda reign that Europeans first established themselves here, the English settlement commencing from 1611 A.D. The English were driven out in 1628, but four years after were reinstated under the "Golden Firman." The Dutch and French did all they could to harass the trade until 1690, when the English appear to have again obtained full trading rights. In 1750, however, the country was given to the French, who held it until 1766, when the Northern Circars were assigned to the English.

The sea deepens so gradually that large vessels cannot anchor nearer than about 5 miles from the shore, and sometimes in the foul season communication is suspended.

The native craft and cargo lighters go up the river and on by the canals to Bezwada and elsewhere, but they can only cross the bar at high tide.

To face page 79.

On 1st August, 1902, Masulipatam Light will be altered from a fixed white light to a group occulting white light showing four occultations every minute.

The depth on the bar is about 6 feet at high water springs, and the beacon at the mouth of the river denotes the position of the best channel across the bar for boats.

The fort, on the sea coast, where the Port and Customs Offices are situated, and where all the cargo is landed and shipped, is usually known as Bandar.

The importance of Masulipatam is now on the decline, the troops have been removed, and her industries have decayed; but the greatest blow of all was the storm wave of 1864 which swept over the entire town, and is said to have destroyed over 30,000 lives and from which she has never recovered.

It is, however, a regular port of call for the British India Company's steamers to Burma and the Indian coast ports.

There is canal communication with Madras and the intervening country and also to Cocanada.

There is a considerable trade carried on principally by native craft, in paddy and rice to Ceylon, and timber is imported from Burma by native craft, who go annually to Chittagong for employment in the jute trade.

It is proposed to connect the port with Bezwada by a branch railway, and it is hoped that the trade will be improved and the port rise to its former importance.

The facilities for landing and shipping cargo at the port are very good, and there are extensive quays on the river-side and canal, and large iron sheds for the storage of cargo.

Boats of 30 to 50 tons can load alongside the quays.

The country all round the fort is low and swampy, and in the rainy season it is frequently under water.

The Flagstaff, in Latitude $16^{\circ} 8' 55''$ N., Longitude $81^{\circ} 9' 9''$ E., is situated in the fort, about $1\frac{1}{2}$ miles inland, and is generally the first object seen in approaching the anchorage. Two clumps of casuarina trees to the northward are also conspicuous, but they are not to be depended upon as they are cut down periodically for firewood.

Masulipatam River Entrance.—An occulting white light elevated 33 feet above high water and visible 11 miles is exhibited from a white lighthouse constructed in $16^{\circ} 9' N.$, $81^{\circ} 10' E.$ on the coast just northward of the river entrance.

The best anchorage is marked by 2 buoys about $1\frac{3}{4}$ miles apart.

The flagstaff bears *W.* $\frac{1}{2}$ *S.* from the northern or black buoy, and *W.* by *N.* $\frac{1}{4}$ *N.* from the southern or red buoy.

During the *N.W.* monsoon it is advisable to anchor south of the red buoy, to enable the boats to reach out from the river in one tack and take advantage of the southerly current.

During the *S.W.* monsoon, however, it is better to anchor close to the northern or black buoy, as the water is generally smoother there, and it is also more convenient for the cargo boats to get home again, and for the vessel to ensure despatch.

It is high water, full and change of the moon, at 8 hours 15 minutes, and spring tides rise $5\frac{1}{4}$ feet, neap tides 3 feet.

The principal exports are paddy, rice, hides, skins, horns, castor seed, turmeric, chillies and gram, valued at 3,600,000 Rupees.

The imports are principally piecegoods, glassware, twist, metals, cement, Mangalore tiles, iron work and timber, valued at 1,600,000 Rupees.

The port is well supplied with boats varying in size from 10 to 50 tons, with a total capacity of about 1,500 tons. The passenger boats are well built and very smart in a breeze.

There are always 300 boatmen available, and labour is sufficient, though not abundant, and rather expensive, the charges being 8 to 10 Annas per man per diem.

The cost of working cargo is from 3 to 6 Annas per ton, and landing and shipping costs from 8 Annas to 1 Rupee per ton, according to the season, and awkward cargo cost about 25 per cent. more.

The port is under the charge of a Port Officer, who is also Registrar of Shipping and Seamen. He is invested with Magisterial powers on all matters connected with the port and shipping.

Fresh water can be procured, but is expensive and not very good, and provisions are scarce and difficult to procure. No stores or coal. Stone ballast will be taken over and landed free by the Municipality.

The port, though at one time very unhealthy, has now greatly improved owing to better sanitary arrangements and good drainage.

There is a Municipal hospital and civil dispensary, where medical aid can be obtained free and European seamen can be admitted.

Kistna Light.—A group-flashing white light showing two flashes every 10 seconds, elevated 140 feet above high water and

visible 18 miles in clear weather, is exhibited from a white lighthouse constructed in Latitude $15^{\circ} 47' N.$, Longitude $80^{\circ} 59' E.$, between False Point Divi and Point Divi.

Point Divi Lighthouse tower stands 48 feet above high water level, and is built of stone, painted white, and is a good landmark.

The coast is very low between Masulipatam and Nizampatam and is often entirely hidden by the haze, the 5 fathom line being about $4\frac{1}{2}$ miles from the shore, and the 10 fathom line being $5\frac{1}{2}$ miles. In the vicinity of False Point Divi and Divi the water should not be shoaled to less than 8 fathoms.

Nizampatam, in Latitude $15^{\circ} 54' 30'' N.$, Longitude $84^{\circ} 42' 35'' E.$, was the first port at which the English commenced to trade on the east coast of India, and they landed on the 26th August, 1611. The factory was established in 1621. The port is mentioned by Ferishta. The English built a house on the creek in 1611 and called it Pettipollée, after the neighbouring village of Pedapalli.

It is frequented by native craft engaged in the coasting trade, and about 20,000 bags of paddy are exported annually to Ceylon, and timber is imported from Rangoon and Moulmein.

The entrance to the river may be known by a large white sand hill 200 feet high on its western bank.

Dindi House is a large house on the beach, and there is a big tree close to it which is 67 feet high.

The best anchorage is with Dindi House and tree bearing $N. 17^{\circ} E.$ magnetic, in $4\frac{1}{2}$ fathoms, mud, and good holding ground. This position is about 6 miles from the shore.

It is high water, full and change, at 9 hours, springs rise $4\frac{1}{2}$ feet, neaps $3\frac{1}{2}$ feet.

The port is under the charge of an Assistant Superintendent of Customs, who is under the Port and Customs Officers of Masulipatam.

There are 30 cargo boats with a total capacity of 250 tons, and there are always 150 boatmen available.

Labour is abundant and cheap.

Fresh provisions can be obtained of good quality and very cheap.

Iperpaleum or Iparapalem, in Latitude $15^{\circ} 46' 30'' N.$, Longitude $80^{\circ} 23' 45'' E.$, is a small port in the Kistna District. It may be recognized by a small grove of brab trees near the beach, and a small town consisting of 15 large brick houses and godowns, and about 150 thatched houses.

It was formerly an occasional port of call for the coasting steamers, but is now only used by small native craft, the only export being firewood. The oil seeds trade has been absorbed by the canal to Madras.

The best anchorage is with the centre of the town bearing *N. 67° W. magnetic*, in 4 to 5 fathoms, sand and mud, and good holding ground.

Mutapolli Bank extends *N.E. by E.* and *S.W. by W.* 4 miles. The least depth is $3\frac{1}{2}$ fathoms, $9\frac{1}{4}$ miles *E.* $\frac{1}{4}$ *S.* from Kottapatam beacon; the bottom consists of hard sand.

Another shoal with only $1\frac{3}{4}$ fathoms on it lies 4 miles *N.E. by E.* from Kottapatam obelisk and 2 miles from the shore. It extends *N.N.E.* and *S.S.W.* $2\frac{1}{4}$ miles with a width of 1 mile. From this shoal patches of shoal water of 3 to 5 fathoms extend for 4 miles towards Mutapolli Bank.

A third shoal of 5 fathoms, $\frac{1}{4}$ of a mile in extent, lies $13\frac{1}{2}$ miles from the coast in Latitude $15^{\circ} 29' 45''$ *N.*, Longitude $80^{\circ} 26' 45''$ *E.*

This part of the coast should be approached with caution and the lead should be in constant use, as the water shoals rapidly from 30 fathoms.

Mutapolli or Motupalli, in Latitude $15^{\circ} 42'$ *N.*, and Longitude $80^{\circ} 20'$ *E.*, is a small seaport, identified with the Mutfili of Marco Polo. It is now a mere fishing village, but must once have been of considerable importance. In Colonel Yules' edition of Marco Polo he says that in 1290 A.D. the court of Queen Rudramma, one of the many female rulers of India, was held here. The port was prominently brought to notice in 1770 as the port used for landing the French troops. It is never used by steamers, and calls for no further mention in this book.

Kottapatam, in Latitude $15^{\circ} 26' 40''$ *N.*, and Longitude $80^{\circ} 12' 15''$ *E.*, was a seaport of some importance, but is now almost deserted. The coasting steamers occasionally called here 20 years ago. There is still a small trade, and native craft call here during the fair season, but most of the trade is now carried on by the Buckingham Canal, and the large godowns, which are very conspicuous from the anchorage, are tumbling down.

There is an obelisk of a dark grey colour surmounted by a flagstaff, the whole being 56 feet above high water level, situated close to the Custom House.

The best anchorage is about $2\frac{1}{2}$ miles from the shore, in $4\frac{1}{2}$ to 5 fathoms, with the obelisk bearing *N.* 67° *W.* magnetic.

The best marks when approaching the anchorage are Chimakenti Hill, 2903 feet high, 21 miles *N.W.* from Kottapatam, and Singarayakonda Temple, the latter can be seen from the 10 fathom line.

There are numerous small ports on this part of the coast that are never used by steamers and call for no further mention in this book.

Between **Kottapatam** and **Isakapilli** there are 2 shoals.

The first with a least depth of $2\frac{3}{4}$ fathoms on it at low water lies 2 miles from the coast, in Latitude $14^{\circ} 54' 35''$ *N.*, Longitude $80^{\circ} 6' 40''$ *E.*

The bottom is uneven, with depths of 4 to 6 fathoms, hard sand, extending about 1 mile around the shoalest part.

The second is about $\frac{1}{4}$ of a mile in extent, with 4 fathoms on it at low water, and lies 2 miles from the coast, in Latitude $14^{\circ} 56' 30''$ *N.*, Longitude $80^{\circ} 6' 30''$ *E.*

Uneven bottom, with occasional patches of $5\frac{1}{2}$ fathoms, extends $5\frac{1}{3}$ miles in a *N.* by *E.* $\frac{1}{4}$ *E.* direction from this shoal to Latitude $15^{\circ} 1' 20''$ *N.*

Isakapilli or in Telugu "Sandy Place," in Latitude $14^{\circ} 44'$ *N.* Longitude $80^{\circ} 8'$ *E.* was formerly of some importance, and large sailing vessels used to load here with salt and grain. The trade has now been diverted to the Buckingham Canal.

The large granaries and godowns are very conspicuous from seaward.

The best anchorage is $\frac{3}{4}$ mile from the beach *N.E.* of the bungalow, to the south of the village, in 5 fathoms, sand and mud.

There are a number of small ports between this place and Armeghon, but they are of no importance, except for a small number of native craft. The trade of these ports has been almost entirely absorbed by the Buckingham Canal.

The **Shallinger Shoal** extends in a north-easterly direction $2\frac{1}{2}$ miles from the coast, having depths on it from $1\frac{1}{2}$ to $2\frac{3}{4}$ fathoms, and in Latitude $14^{\circ} 21'$ *N.*, there is a depth of $4\frac{1}{2}$ fathoms at a distance of 3 miles from the shore; outside this the soundings are regular.

Armeghon, or Dugarazptam, or in Telugu "City of the minister," is a small town of little or no importance. It was one of the first British settlements on the Coromandel Coast in 1625; and in 1628

a factory was built at Chenna-Kupam and re-named Arumugam, in recognition of the friendly aid given by a chief of that name. The factory was fortified with twelve guns. It was owing to the interference of the Dutch, and the open hostility of the Venkatagiri Rajah that the English abandoned the settlement, and purchased the present site of the city of Madras.

The Light, in Latitude $13^{\circ} 53' 08''$ N., Longitude $80^{\circ} 11' 47''$ E., is situated on the mainland close to the village of Moonapollum, $\frac{1}{4}$ of a mile from the coast, and N.N.W. $\frac{1}{4}$ W. from Point Pudi.

It is a revolving, white, dioptric light of the 4th order. The flash is in periods of 45 seconds, the flash being of about five seconds' duration, and is visible seaward from N.E. through West to S.E. and can be seen 14 miles in clear weather. The column is built of stone, painted white, and the height of the lantern is 107 feet above high water level. The light was improved in 1893. The light is obscured by trees on bearings north of N.N.W.

Armeghon Shoals extends from near Point Pudi for about 15 miles in a northerly direction with depths on them from $1\frac{3}{4}$ to $4\frac{3}{4}$ fathoms. The south extreme of the shoal lies $1\frac{1}{2}$ miles N.E. by N. from Point Pudi.

The eastern edge of the shoal lies 6 miles from the coast with the 10 fathom line only one mile further eastward.

From the shoalest part, in $1\frac{3}{4}$ fathoms, the Lighthouse bears N.W. by W.

From the broadest part of the shoal, with depths of 2 to 4 fathoms over it, the Lighthouse bears West.

Point Pudi Shoal, with 1 to 3 fathoms on it, extends for $2\frac{1}{4}$ miles in a S.E. by S. direction, and breaks during the rough weather.

The outer edge of the shoal, with 4 fathoms on it, is $2\frac{1}{2}$ miles from the coast.

Pulicat lies at the southern extremity of an island, which divides the sea from the large lagoon called the Pulicat Lake, which is about 20 miles long. It is under the influence of the tides, and was probably formed by an inroad of the sea during a storm, when the sea topped the low ridges of the coast line.

It belonged to the Dutch in 1609, and traces of their occupation are still in existence in the remains of a fort, and a cemetery, containing the tombstones of former Dutch Governors, over 300

To face page 84.

Arneghon Light has been altered to a group flashing white light, showing three flashes in quick succession, every ten seconds, elevated 97 feet above high water and visible 15 miles in clear weather.

years old and in good preservation. It came into the possession of the English in 1795. The lake is connected with Madras by canal.

The best anchorage is with the Light bearing West, in 6 fathoms, about $2\frac{1}{2}$ miles from the shore.

Steamers bound to Pulicat should not come under 15 fathoms until the Lighthouse bears West and the Madras Lighthouse *S.S.W.* $\frac{1}{2}$ *W.*, then steer West and anchor as directed.

The town can be seen from seaward, and there is a tall monument just to the north of the Lighthouse.

The **Pulicat Light**, in Latitude $13^{\circ} 25' 15''$ N., Longitude $80^{\circ} 19' 6''$ E., is situated near the beach, and is a fixed, white, dioptric light of the 4th order, illuminating an arc from N. by W. through West to S. by E., and standing 68 feet above high water level, and is visible in clear weather 14 miles.

The Lighthouse is built of stone, and is painted with white and black alternate bands, to distinguish it from Armeghon Lighthouse.

It is intended to guide vessels off the Pulicat shoals which consist of several patches of hard sand on which the depth varies from $2\frac{1}{4}$ to $3\frac{1}{4}$ fathoms.

The southern patch, with $2\frac{3}{4}$ fathoms on it, lies N. by E. $\frac{3}{4}$ E., $6\frac{3}{4}$ miles from Ennore Beacon, and $1\frac{3}{4}$ miles from the shore. From this patch the shoals extend in a N.N.E. direction for 3 miles.

The northernmost patch, on which there is $3\frac{1}{4}$ fathoms, lies S.E. by E. $\frac{1}{4}$ E., $4\frac{3}{4}$ miles from Pulicat Lighthouse.

Pulicat Lighthouse, in line with Kettle Bottom Hill, bearing West leads northwards of the shoals.

Ennore Shoal, with less than 3 fathoms on it, projects $1\frac{3}{4}$ miles from the coast in a N.E. direction, commencing $2\frac{1}{2}$ miles northward of Ennore Beacon.

Madras Lighthouse, bearing *S.S.W.* $\frac{1}{2}$ *W.* leads clear of the shoal.

Ennore, in Latitude $13^{\circ} 13' 40''$ N., Longitude $80^{\circ} 21' 55''$ E., is in reality only a fishing village, but being formerly a favourite resort of Europeans from Madras, it contains several bungalows, built on the slip of land between the backwater and the sea. In 1769, Haidar Ali encamped here. It is in communication with Madras by railway and canal. Salt is exported from here, but is a Government monopoly.

The best anchorage is with the Ennore Beacon, bearing *N.W.* $\frac{1}{2}$ *W.* about 1 mile from the shore.

Ennore Beacon is a white obelisk, 54 feet high, on the sand spit, on the south side of the entrance to the backwater.

Masulipatam.

Kistna District.

Ordinary Rates.

To or from a vessel in or under 5 fathoms low water to or from the Pier head—

| | | Rs. | As. | P. |
|--|----------|-----|-----|----|
| First class boats | per trip | 10 | 0 | 0 |
| Second and third class boats and accommodation boats | „ | 7 | 8 | 0 |
| Catamarans | „ | 0 | 8 | 0 |
| To or from a vessel outside of 5 fathoms low water— | | | | |
| First class boats | „ | 15 | 0 | 0 |
| Second and third class boats and accommodation boats | „ | 10 | 8 | 0 |
| Catamarans | „ | 1 | 0 | 0 |

Extraordinary Rates.

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Kottapalem, Nizampatam, Ipurupalem, and Motupalle.

Kistna District.

Between sunrise and 8 p.m.

| | | Rs. | As. | P. |
|--|----------|-----|-----|----|
| Accommodation boat | per trip | 2 | 0 | 0 |
| Do. return trip from same vessel | | 1 | 0 | 0 |
| Do. „ „ different vessel | | 2 | 0 | 0 |
| Cargo boat | per trip | 1 | 8 | 0 |
| Do. return trip from same vessel | | 0 | 12 | 0 |
| Do. „ „ different vessel | | 1 | 8 | 0 |
| Do. carrying ballast | per trip | 1 | 12 | 0 |
| Do. „ horses | „ | 2 | 0 | 0 |
| Do. „ carriage for each boat | „ | 2 | 8 | 0 |
| Do. water | „ | *3 | 0 | 0 |

Transshipping,

| | | | | |
|--|----------|---|----|---|
| For first trip, in addition to the ordinary fare | per trip | 1 | 0 | 0 |
| For each succeeding trip | per day | 0 | 12 | 0 |

* This includes cost of filling casks, providing ropes, buckets, etc.

Extraordinary Rates.

Between 8 P.M. and 4 A.M., provided the boat leaves the shore after 8 P.M., per trip Double the ordinary rate.
 Between 4 A.M. and sunrise, per trip An ordinary rate and a half.
 During the period that either the surf or the current flag may be hoisted, and on all occasions when a boat carries double crew by direction of the Port Officer . . . Double the ordinary rate.
 In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

**Kottapatam, Itammukkala, Ramavapatam
and Iskapalli.**

Nellore District.

Between sunrise and 8 p.m.

| | | Boats of 4 tons and upwards. | | | Masula boats. | | |
|----------------------|--|------------------------------|-----|----|---------------|-----|----|
| | | Rs. | As. | P. | Rs. | As. | P. |
| Accommodation | Masula boat per trip | 2 | 0 | 0 | | | |
| Do. | „ return trip from same vessel | 1 | 0 | 0 | | | |
| Do. | „ „ „ different vessel | 2 | 0 | 0 | | | |
| | | Boats of 4 tons and upwards. | | | Masula boats. | | |
| | | Rs. | As. | P. | Rs. | As. | P. |
| Cargo boat | per trip | 2 | 0 | 0 | 1 | 8 | 0 |
| Do. | return trip from same vessel | 1 | 0 | 0 | 0 | 12 | 0 |
| Do. | „ „ different vessel | 2 | 0 | 0 | 1 | 8 | 0 |
| Do. | landing horses, for each boat . . . per trip | 3 | 0 | 0 | 2 | 0 | 0 |
| Do. | „ carriages, for each boat used „ | 3 | 0 | 0 | 2 | 8 | 0 |
| Do. | carrying ballast „ | 2 | 2 | 0 | 1 | 12 | 0 |
| Do. | water „ | *1 | 10 | 0 | 3 | 0 | 0 |

Transshipping.

| | | | | | | |
|---|----|----|---|---|----|---|
| For first trip, in addition to the ordinary fare in each case | 1 | 0 | 0 | 0 | 12 | 0 |
| For each succeeding trip during the day | 0 | 12 | 0 | 0 | 8 | 0 |
| Catamarans per trip | -- | | | 0 | 4 | 0 |
| Do. when employed for rafting timber, landing or shipping dead weight | — | | | 1 | 0 | 0 |

Extraordinary rates.

Between 8 P.M. and 4 A.M., provided the boat leaves the shore after 8 P.M., per trip Double rates.
 Between 4 A.M. and sunrise An ordinary fare and a half for all boats.
 During the period that either the surf or current flag may be hoisted, and on all occasions when a boat carries a double crew, by direction of the Port Officer, or Port Conservator Double the ordinary rate.

* This charge includes all expenses connected with filling casks, etc., as bringing the water alongside the vessel.

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Madras. The site of land on which Madras now stands was granted to Mr. Francis Day, chief of the English settlement at Armeghon, in 1639. It was then a village, but a factory was soon established, and some fortifications were erected.

According to Dr. Burnell, the derivation of the name is "Madrissa," a Muhommadan school; and it was known as Madraspatnam, or by the natives as Chennapatnam, after the brother of the local nayak who was named Chenappa.

From the date of its foundation until 1653 Madras was subordinate to the English settlement at Bantam, in Java, but was in that year raised to the rank of an independent Presidency.

Fort St. George was commenced by Mr. Day in 1639, and was improved from time to time till 1702, when it withstood its first attack. It was bombarded and captured by the French troops under La Bourdonnais in 1746, but was again restored to the English in 1749. During the interval the French greatly strengthened the fort, and after it was restored the work they began was completed, and the bastions and batteries were enlarged, the whole work taking until 1758 to complete. In that year the French under Lally again tried to take it, but it was successfully defended by Pigott and Lawrence, with the aid of the British fleet. The fort, as it now stands, was finished in 1787.

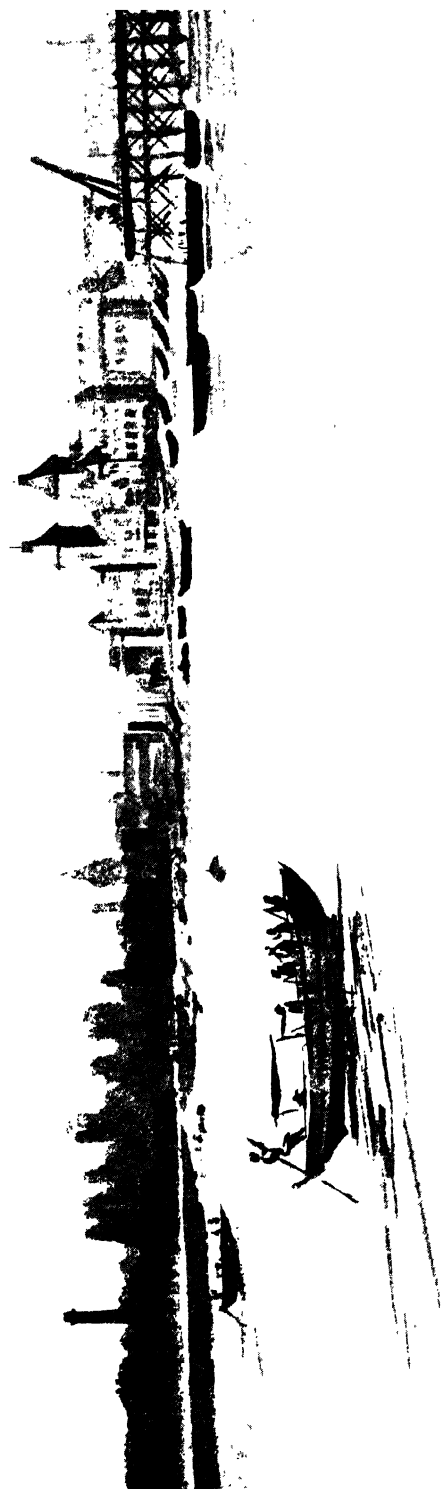
As early as 1690 some attempt was made to protect Black Town, and a mud wall was built round the north and west sides of the town, traces of which are still in existence.

Haidar Ali threatened the town twice, in 1769 and 1780, but since that time Madras has continued to thrive and prosper.

The town of Saint Thome, which is now part of Madras, was formerly a Portugese settlement, and was founded and fortified in 1504; it was afterwards held by the French from 1672 till it was sacked by Zulfikar Khan in 1698, and eventually came into our possession in 1749.

The present town, with its suburbs, extends nine miles along the coast, and runs $3\frac{1}{2}$ miles inland, having a total area of over 27 square miles, and a population of over 600,000.

The harbour, which is now practically completed, is an enclosed



basin, formed by running out two solid breakwaters into the sea at right angles to the beach.

The inside breadth to the harbour is about 500 yards, and the breakwaters are run out into 7 fathoms of water, a distance of about 1200 yards.

At the seaward end the piers turn inward so as to form the enclosure, the entrance at the centre being about 500 feet wide.

There is shelter inside for the largest and deepest draught vessels, and as many as 14 large steamers can be accommodated at one time.

Vessels are now moored, head and stern, to buoys laid down for that purpose. Buoys are laid down for all the moorings. Inside the regular moorings are 4 small buoys, to which native craft and small steamers can make their sterns fast, using their own anchors ahead.

Cargo is landed and shipped from the pier and the beach, and special arrangements have been made for landing horses on the breakwater.

Petroleum in bulk is pumped out through a pipe on the breakwater.

Still further improvements are under contemplation by the Madras Government.

Timber, kerosene oil in large quantities, and other cargo not permitted to be discharged inside the harbour, are landed on the beach to the north of the harbour, and 2 buoys painted red are laid down for stern moorings, as well as for warping timber on shore.

The southern buoy is in 5 fathoms, $2\frac{1}{2}$ cables from the northern arm of the harbour, with Madras Lighthouse bearing *S.W.* by *S.* and $3\frac{1}{4}$ cables from the beach.

The northern buoy is in 5 fathoms also, 6 cables from the northern arm of the harbour, with Madras Lighthouse bearing *S.S.W.* $\frac{3}{4}$ *W.* and $3\frac{3}{4}$ cables off shore.

Steamers arriving at night must anchor off the entrance in not less than 9 fathoms, and vessels are prohibited from anchoring in any part of the roads southward of the line of the Lighthouse bearing West, on account of the submarine cable.

Pilotage is compulsory, and no more than one vessel may leave or enter the harbour at the same time. Steamers may leave after dark, but are only allowed to enter as a special case. Vessels about to leave are to hoist flag *N.* at the fore, and if about to enter flag *F.* of the International Code.

Steam vessels arriving at Madras should not approach the entrance of the harbour too closely, but wait for a pilot in not less than 9 fathoms of water. There are 3 pilots, and no vessel is allowed to enter or leave Madras harbour without a pilot, unless authority to that effect has been given in writing by the Conservator of the Port.

The pier was finished in 1862, and is 1350 feet long by 40 feet broad, with a T head 160 feet long.

Four lines of railway are laid down along its entire length, and there are 21 cranes for landing and shipping cargo.

Passengers can land at the steps, except in bad weather, and there are carriages on the pier which can be used on application.

There are 5 fixed cranes capable of lifting from 3 to 20 tons, and there are also two 40 cwt. steam cranes and thirteen 30 cwt. hand cranes.

The pier has been breached twice by vessels running through it.

In 1887 the pier was altered and improved at considerable cost, when large good sheds were built and large cranes were erected for lifting heavy goods, and placed on the shore end.

The Light, in Latitude $13^{\circ} 5' 13''$ N., Longitude $80^{\circ} 16' 52''$ E., is situated on the main tower of the Law Courts, on the esplanade North of the Fort, and is a white, flashing, dioptric light of the 3rd order, illuminating an arc of 360° and visible from all directions seaward on the following bearings, from North to East through West to S. by W. The flashes occur at half minute periods, giving two flashes of about 2 seconds, separated by an eclipse of about 3 seconds, followed by a longer eclipse of 23 seconds.

The lighthouse stands 166 feet above high water level, and is visible in clear weather 20 miles. The tower is an octagonal structure of brick and stone, with a gilded dome.

There are 2 red fixed lights on the towers marking the entrance to the harbour, which are visible all round the compass at a distance of 6 miles.

There are also 2 leading lights for the use of the pilots when leaving the harbour, or for making the anchorage at night time. The red light is on the end of the pier, and the green light is on the terrace of the Customs Office. They are visible for 5 miles, from S. $51^{\circ} 45'$ W. through West to N. 17° W.

It is high water, full and change of the moon, at 9 hours 1 minute, and spring tides rise $3\frac{1}{2}$ feet, neap tides $2\frac{1}{2}$ feet. The

semaphore on the Port Officer's Flagstaff is dropped at 1 hr. P.M. Madras mean time, corresponding to 19 hr. 39 m. 0.6 seconds Greenwich mean time. A gun is fired at noon and 8 P.M. Madras mean time.

When the semaphore fails to drop, or is dropped incorrectly, the signal C. V. N. J. is hoisted and kept flying for half an hour. When this is the case, the semaphore is dropped again at 2 hours P.M. Madras mean time, corresponding to 20 hours 39 min. 0.6 seconds Greenwich mean time.

The Madras cyclones usually commence with the wind from N.N.E. to N.N.W., the wind changing to the eastward or westward as the port may be left in the right or left hand semicircle of the storm.

A memorable cyclone occurred in October 1746, when La Bourdonnais' fleet and prizes were entirely destroyed, and 1200 men drowned. Other cyclones causing grievous loss of life and property have occurred in 1782, 1807, and 1811.

In 1872, a most destructive cyclone visited Madras, when 20 vessels were driven ashore, but owing to the skilful way in which the rocket apparatus was worked, and the bravery of the boatmen and others, only 19 lives were lost. Cyclones were also experienced in 1874 and 1877 and in 1881, on which last occasion the harbour, then just completed, was very seriously injured, one arm being rendered quite useless.

The principal exports are indigo, cotton, hides, ground nuts, jaggery, coffee, etc., valued at 60,000,000 Rupees.

The principal imports are coal, iron, machinery, Manchester goods, railway material and stores, explosives, petroleum, etc., valued at 80,000,000 Rupees.

The number and tonnage of cargo boats in the port are

| | | |
|-----------------------|--------------|-----------------------|
| 90 Lighters | representing | 1000 tons |
| 172 Masulah Boats | „ | 450 „ |
| 46 Jolly Boats | „ | 50 „ |
| <hr/> Total 308 Boats | | <hr/> Total 1500 tons |

There are sufficient lightermen to man all the boats, and labour is abundant and experienced.

The cost of working cargo is from 2½ Annas to 6 Annas, according to the nature of the cargo handled.

The cost of landing and shipping is from 12 to 13 Annas a ton, but it can be done at a lower rate by contract.

The port is under the charge of a Commander of the Royal Indian Marine, who is the Deputy Conservator of the Port.

The Collector of Customs is an officer of the Indian Civil Service.

Supplies and stores are plentiful and cheap. Fresh water is laid on by pipes to the end of the pier, and there are 11 water boats for supplying the shipping.

Coal can be obtained, it is usually shipped in bags, in Masulah boats, and can be put on board at the rate of about 200 tons a day.

Repairs of any description can be executed at the various workshops, and large castings can be made.

There are, however, no dry docks, and no repairs can be executed to hulls of vessels.

The health of the port is generally good, and no quarantine is enforced at Madras, unless a vessel has infectious or contagious disease on board.

European Officers and seamen are treated at the General Hospital, and the charges are 2 Rupees a day for officers and 1 Rupee 4 Annas a day for seamen. Lascars 2 Annas 6 Pies per day, but they can be treated free of charge at the Monegar Choultry.

There are no hospital dues on shipping.

The weather is uncertain during April, May, October and November, when Cyclones may be experienced.

The usual fee for survey or measurement is 32 Rupees, and the same fee is charged for the survey of hatches.

Rates of brokerage are according to Chamber of Commerce Rules.

Madras is connected with the Indian Railway and Telegraph systems.

The British India and Clan Line run regularly to and from Europe.

The British India have also weekly communication with the Indian coast ports, a bi-weekly service to Rangoon, and a monthly service to the Straits' Settlements. The Asiatic Company's steamers call here fortnightly for the coast ports, and also run the mail to and from the Andaman Islands.

The most conspicuous building in Madras from seaward is the Post Office, the towers of which can be seen 18 miles away.

Madras Chamber of Commerce Rates of Agency and Commission.

| | Per cent. |
|---|-----------|
| 1. Purchasing or selling Bills of Exchange | 1 |
| 2. On ships' disbursements | 2½ |
| 3. On ships' disbursements, when no outward commission on freight or passage money is earned | 5 |
| 4. On chartering ships or engaging tonnage | 2½ |
| 5. On the amount of freight or passage money earned by ships, by charter or otherwise, whether the same shall pass through the agent's hands or not | 5 |
| 6. When the commission of 2½ per cent. on the inward freight, paid at home or in Madras, does not in the case of steamers, via Suez Canal, exceed 100 Rupees then that sum shall be charged, viz. | 2½ |
| 7. On settling losses, insurance claims and averages of all classes | 2½ |
| 8. On negotiating bottomry or respondentia bond | 2½ |
| 9. On attending delivery of goods | 2 |
| 10. On receiving passage money by ships entered inwards | 1 |
| 11. On realizing freights | 2½ |
| 12. On arranging and superintending the transshipment of cargo on the amount of freight so re-engaged | 5 |
| 13. On the management of vessels chartered elsewhere for the conveyance of coolies or troops, on amount of passage money | 2½ |
| 14. On landing and re-shipping goods from any vessel in distress, or on landing and selling by auction damaged goods and acting as agent for the master on behalf of all concerned, on the declared value of all such goods as may be re-shipped, and on the net proceeds of all such goods as may be publicly sold | 2½ |
| 15. That brokerage at the rate of ¼ per cent. be an accepted charge on all freight. | |
| 16. When the freight is payable in sterling, the commission shall be calculated on the sterling amount at the following rates for Bank Bills, viz., at the rate for 6 months' sight Bank Bills when the vessel is a sailing ship, and at the rate for 3 months' sight when the freight is by steamer. | |
| 17. On ships leaving the port in ballast, which have been consigned inward, upon the English net registered tonnage, 6 Annas per ton. | |
| 18. On steamers leaving the port in ballast, which have been consigned inward, upon the English net registered tonnage, 8 Annas per ton. | |
| 19. On ships leaving the port in ballast, which have been consigned inwards and outwards, on the English net registered tonnage 12 Annas a ton and steamers 1 Rupee per ton. | |
| 20. When the amount on which commission is payable is stated in Rupees, the commission shall be calculated in that currency; and when in sterling, at the rate provided for under the rule which fixes the rate "on procuring freight." | |

21. With respect to a steamer or sailer partially discharged, which does not return to the port for cargo on her homeward voyage, the rate shall be 8 Annas a ton discharged, provided the total amount exceeds Rupees 100, failing which Rupees 100 shall be charged.
22. The conversion into Indian currency of sterling, freight payable in Madras shall, unless otherwise stipulated, be made at the rate for Bank Bills on London payable on demand, and the rate ruling at the close of a mail should be the rate applicable to such purpose during the subsequent week.
23. That brokerage on a forward contract shall be payable on the completion of the transaction.

Rates for Landing and Shipping Cargo at Madras.

1. Annas 12 per ton of 50 cubic feet, or 20 cwt., or 210 Imperial gallons; provided that goods manifested for transshipment shall, if landed and re-shipped, pay no charge for harbour upon re-shipment; that explosives for other ports compulsorily landed at Madras to enable a vessel to enter the harbour, and seamen's effects and fittings be passed free, and that the rate on salt exported be 4 Annas per ton.
2. For each package of bullion or coin, one Rupee per package.
3. For each elephant, Rupees 50.
For each horse or pony, if landed on or shipped from the beach, Rupees 7-8; if landed or shipped from any wharf or pier, Rupees 10.
For each bull, bullock, or cow Rupees 2-8.
4. When portaged by the Harbour Trust, the following rates will be levied, in addition to the above :—

| | Per ton. | | |
|--|----------|-----|----|
| | Rs. | As. | P. |
| For coal, coke, and patent fuel, for carrying, stacking, weighing and loading or unloading from railway trucks | 1 | 1 | 0 |
| Iron work for carrying, sorting, delivering, weighing and loading or unloading | 0 | 14 | 0 |
| Railway material : | | | |
| Bridge work | 0 | 4 | 0 |
| Permanent way material | 0 | 4 | 0 |
| Rolling stock | 0 | 4 | 0 |
| Timber | 1 | 0 | 0 |
| Rails | 0 | 4 | 0 |
| Other material | 0 | 2 | 0 |
| Machinery, boilers, girders and castings | 0 | 4 | 0 |
| Bullion and coin, per package | 0 | 2 | 0 |
| Salt, sugar, grain, and other bag cargo | 0 | 4 | 0 |
| Bales and cases of piece goods | 0 | 6 | 0 |
| All other goods | 0 | 8 | 0 |

5. For the wharfage of goods three days free, then Rupees 5 per ground per mensem.
6. For crantage : not exceeding 10 cwt. each package, at the rate of 4 Annas per ton.
Exceeding 10 cwt. and not exceeding 20 cwt., each article at the rate of 8 Annas per ton.
Exceeding 20 cwt. and not exceeding 40 cwt., each article at the rate of Rupees 1-8 per ton.

Each article exceeding 2 tons at the rate of Rupees 2-8 a ton.

Measurement goods 4 Annas per ton.

7. For the storage of goods : three days free, exclusive of days of shipment, landing and delivery, and of Sundays, and Chambers of Commerce holidays.

For 16 running days thereafter :—

If stored in sheds, one Anna per ton per day.

If stored in the open, 6 pies per ton per day.

8. For the demurrage of goods, liable to storage, double the rates as above.
9. For the demurrage of goods, liable to wharfage, Rupees 20 per ground per mensem, except for fuel and timber.

Rates of Port Dues in the Madras Presidency.

| Name of Port. | Vessels chargeable (sea-going vessels of 15 tons and upwards). | Rates of port dues per ton. | Due how often chargeable in respect of the same vessel. |
|------------------|---|--------------------------------|---|
| 1 | 2 | 3 | 4 |
| Madras | Foreign Vessels. | | |
| | (a) Vessels engaged in trade with the Straits Settlements or Ceylon | | |
| | i. Ships. | 2 Annas | The payment of the due at the port will exempt the ship or steamer for a period of 60 days from liability to pay the due again. |
| | ii. Steamers | 3 „ | |
| | (b) Other Vessels | | The due is payable on each entry into the port. |
| | i. Ships. | 2 Annas | |
| | ii. Steamers | 2½ „ | |
| | Coasting Vessels | | The payment of the due at the port will exempt the ship for a period of 30 days from liability to pay the due again. |
| | (c) Ships | 1½ Annas | |
| | (d) Steamers | 1¾ Annas | The due is payable once in 30 days. |

| Name of Port. | Vessels chargeable (sea-going vessels of 15 tons and upwards). | Rates of port dues per ton. | Due how often chargeable in respect of the same vessel. |
|---------------------------------|---|---|--|
| 1 | 2 | 3 | 4 |
| Out-ports: Eastern Group | | | |
| Ganjam. | | | |
| 1. Gopalpur | Foreign Vessels, whether Ships or Steamers i. Vessels calling at only one port within the East- ern Group | | |
| 2. Baruva . . . } | | | |
| 3. Poondi . . . } | | | |
| 4. Calingapatam | | | |
| Vizagapatam. | | | |
| 5. Konada. | (a) Vessels trad- ing with the Straits Settle- ments. | 2 Annas | The payment of the due at the port will exempt the ship or steamer for a period of 60 days from lia- bility to pay the due again at that port. |
| 6. Bimlipatam. | | | |
| 7. Vizagapatam. | | | |
| 8. Pudimadaka. | | | |
| 9. Pentakota. | | | |
| Godavari. | | | |
| 10. Uppada . . . } | (b) Other Vessels. | 2 Annas | The due is payable on each entry into the port. |
| 11. Cocanada . . . } | | | |
| 12. Coringa . . . } | | | |
| 13. Bendamurulanka | | | |
| 14. Narsapur . . . } | | | |
| 15. Perupalem . . . } | | | |
| Kistna. | | | |
| 16. Masulipatam . . . } | ii. Vessels calling at more than one port within the Eastern Group. | | |
| 17. Penumudi . . . } | | | |
| 18. Morutota . . . } | (c) Vessels trad- ing with the Straits Settle- ments. | 1½ Annas in addition to the due chargeable under i. (a) at the first port called at. | The payment of the due at the first port called at in the group will exempt the ship or steamer for a period of 60 days from liability to pay the due again at that or any other port in the group. |
| 19. Nagayalanka . . . } | | | |
| 20. Kottapalem . . . } | | | |
| 21. Gangadipalem . . . } | | | |
| 22. Nizampatnam . . . } | | | |
| 23. Ipurupalem . . . } | | | |
| 24. Bodduvanipalem . . . } | | | |
| 25. Motupalle . . . } | | | |

| Name of Port. | Vessels chargeable (sea-going vessels of 15 tons and upwards.) | Rates of port dues per ton. | Due how often chargeable in respect of the same vessel. |
|----------------------------|---|---|--|
| 1 | 2 | 3 | 4 |
| Nellore. | | | |
| 26. Kanuparti | | | |
| 27. Kottapa'nam | | | |
| 28. Itamukkala | (d) Other vessels | 1½ Annas in addition to the due chargeable under i. (b) at the first port called at. | The due is payable once for the voyage. |
| 29. Pakala | | | |
| 30. Karedu | | | |
| 31. Ramayapatnam | | | |
| 32. Chennaiyapalem . . . | Coasting vessels | | |
| 33. Tummalapenta . . . | | | |
| 34. Juvaladinne . . . | (e) Ships calling | 1 Anna | The payment of the due at the port will exempt the ship for a period of 60 days from liability to pay the due again at that port. |
| 35. Isakapulle . . . | at any port. | | |
| 36. Ponnepudi . . . | | | |
| 37. Maipadu . . . | | | |
| 38. Kristnapatam . . . | | | |
| 39. Pamanji . . . | | | |
| 40. Tupili . . . | | | |
| 41. Dugarazpatnam . . . | (f) Steamers call- | 3 Annas | The payment of the due at the first port called at in the group will exempt the steamer for a period of 30 days from lia- bility to pay the due again at that or any other port in the group. |
| 42. Pudi . . . | ing at one or more ports within the Eastern Group. | | |
| Chingleput. | | | |
| 43. Pulicat | | | |
| 44. Ennore | | | |
| 45. Covelong | | | |
| South Arcot. | | | |
| 46. Marakanam . . . | | | |
| 47. Cuddalore . . . | | | |
| 48. Port Novo . . . | | | |
| Tanjore. | | | |
| 49. Tirumalavasal . . . | | | |
| 50. Kodiyampalaiyam . . . | | | |
| 51. Tranquebar | | | |
| 52. Nagore . . . | | | |
| 53. Negapatam . . . | | | |
| 54. Velangani . . . | | | |
| 55. Toputurai . . . | | | |
| 56. Point Calimere . . . | | | |
| 57. Muttupet | | | |
| 58. Adirampatnam . . . | | | |
| 59. Gopalapatnam . . . | | | |
| 60. Kattumavadi . . . | | | |
| 61. Kristnajiapatnam . . . | | | |

| Name of Port. | Vessels chargeable (sea-going vessels of 15 tons and upwards). | Rates of port dues per ton. | Due how often chargeable in respect of the same vessel. |
|---------------------------------|--|--------------------------------|---|
| 1 | 2 | 3 | 4 |
| 62. Ammapatnam . . . } | | | |
| 63. Kottaiapatnam . . . } | | | |
| 64. Sundarapandiya- patnam) | | | |
| Madura. | | | |
| 65. Pasipatnam . . . } | | | |
| 66. Damodara patnam . . . } | | | |
| 67. Tondi . . . } | | | |
| 68. Nambitalai . . . } | | | |
| 69. Pudupatnam . . . } | | | |
| 70. Karangadu . . . } | | | |
| 71. Tirupalayanudi . . . } | | | |
| 72. Devipatnam . . . } | | | |
| 73. Mudiyanpatnam . . . } | | | |
| 74. Attankarai . . . } | | | |
| 75. Emanangundu . . . } | | | |
| 76. Pillaimadum . . . } | | | |
| 77. Pamban . . . } | | | |
| 78. Ramesvaram . . . } | | | |
| 79. Mandapam . . . } | | | |
| 80. Vadulai . . . } | | | |
| 81. Murakayapatnam . . . } | | | |
| 82. Muttupettai . . . } | | | |
| 83. Kilarkarai . . . } | | | |
| 84. Ervadi . . . } | | | |
| 85. Valinokkam . . . } | | | |
| Tinnevely. | | | |
| 86. Vaippar . . . } | | | |
| 87. Tuticorin . . . } | | | |
| 88. Kayalpatnam . . . } | | | |
| 89. Kulasekharapatnam . . . } | | | |
| Out-ports. Western Group | | | |
| Malabar. | | | |
| 90. Cochin . . . } | | | |
| 91. Arrupuram . . . } | | | |
| 92. Kukkuyi . . . } | | | |
| 93. Madayi . . . } | | | |
| 94. Attukuri . . . } | | | |
| 95. Chavakad . . . } | | | |
| | Foreign vessels whether ships or steamers. i. Vessels calling at only one port within the Western Group. | | |

| Name of Port. | Vessels chargeable (sea-going vessels of 15 tons and upwards). | Rates of port dues per ton. | Due how often chargeable in respect of the same vessel. |
|---|---|---|--|
| 1 | 2 | 3 | 4 |
| Out-ports. Western Group, continued. | Coasting vessels contd. | | |
| 96. Veliyangod . . . } | (a) Vessels trading with the Straits Settlements. | 2 Annas | The payment of the due at the port will exempt the ship or steamer for a period of 60 days from li- ability to pay the due again at that port. |
| 97. Ponani . . . } | | | |
| 98. Kuttayi . . . } | | | |
| 99. Parapanna . . . } | | | |
| 100. Tanur . . . } | | | |
| 101. Parpanangadi . . . } | (b) Other vessels. | 2 Annas | The due is payable on each entry into the port. |
| 102. Kadalvandi . . . } | | | |
| 103. Beypore . . . } | | | |
| 104. Molakkadava . . . } | | | |
| 105. Calicut . . . } | | | |
| 106. Pundiyangadi . . . } | Coasting vessels. ii. Vessels calling at more than one port within the Western Group. | | |
| 107. Elaturu . . . } | | | |
| 108. Kappatta . . . } | | | |
| 109. Quilandi . . . } | | | |
| 110. Kollam . . . } | | | |
| 111. Kadalura . . . } | (c) Vessels trading with the Straits Settlements. | 1½ Annas in addition to the due chargeable under i. (a) at the first port called at. | The payment of the due at the first port called at in the group will exempt the ship or steamer for a period of 60 days from liability to pay the due again at that or any other port in the group. |
| 112. Trikodi . . . } | | | |
| 113. Kottakkal . . . } | | | |
| 114. Badagara . . . } | | | |
| 115. Muttankal . . . } | | | |
| 116. Chompayi . . . } | (d) Other vessels. | 1½ Annas in addition to the due chargeable under i. (a) at the first port called at. | The due is payable once for the voyage. |
| 117. Kallayi . . . } | | | |
| 118. Talayi . . . } | | | |
| 119. Tellicherry . . . } | | | |
| 120. Dharmapatnam . . . } | | | |
| 121. Ezhara . . . } | (c) Ships calling at any port. | 1 Anna | The payment of the due at the port will exempt the ship for a period of 60 days from liability to pay the due again at that port. |
| 122. Cannanore . . . } | | | |
| 123. Pudiyangadi . . . } | | | |
| 124. Palapatnam (Baliapatnam) . . . } | | | |
| 125. Ettikulam . . . } | | | |
| 126. Kavvayi . . . } | | | |
| South Canara. | | | |
| 127. Hosdrug . . . } | (c) Ships calling at any port. | 1 Anna | The payment of the due at the port will exempt the ship for a period of 60 days from liability to pay the due again at that port. |
| 128. Baikal . . . } | | | |
| 129. Kasaragod . . . } | | | |
| 130. Kumbale . . . } | | | |
| 131. Manjeswara . . . } | | | |
| 132. Mangalore . . . } | | | |

| Name of Port. | Vessels chargeable (sea-going vessels of 15 tons and upwards.) | Rates of port dues per ton. | Due how often chargeable in respect of the same vessel. |
|---|---|--------------------------------|--|
| 1 | 2 | 3 | 4 |
| Out-ports. Western Group, <i>continued</i> . | Coasting vessels, <i>contd.</i> | | |
| 133. Mulki | (f) Steamers call- ing at one or more ports with- in the Western Group. | 3 Annas | The payment of the due at the first port called at in the group will exempt the steamer for a period of 30 days from li- ability to pay the due again at that or any other port in the group. |
| 134. Padubidri | | | |
| 135. Ermala | | | |
| 136. Uchhila | | | |
| 137. Kaup | | | |
| 138. Udiyavara | | | |
| 139. Malpe | | | |
| 140. Barkur or Hangarakatta | | | |
| 141. Coondapoor | | | |
| 142. Nayakinakatte | | | |
| Nayakkankattai | | | |
| 143. Baindur | | | |
| 144. Siruru | | | |

Explanation.—In this part of the schedule—

- (a) “Ship” means a sailing vessel, and “steamer” a steam vessel;
- (b) “Coasting ship” or “coasting steamer” means respectively a ship or steamer which at any port discharges cargo exclusively from, or takes in cargo exclusively for, any port in the island of Ceylon or in any part of India between the westernmost part of Sind and the south-easternmost part of Burma; and “coasting steamer” includes a coasting steam vessel having a general pass under section 164 of the Sea Customs Act, 1878;
- (c) “Foreign ship” or “foreign steamer” means respectively a ship or steamer not being a coasting ship or coasting steamer;
- (d) “Voyage.” In the case of vessels other than those trading with Straits Settlements, after calling at a port in the western group and taking in cargo, proceeding to some other port in the same group, and then returning to the first port to complete loading before finally sailing for Europe, the two visits are to be considered as occurring in one and the same voyage for the purposes of port dues.

In exercise of the powers conferred by section 46 of the Indian Ports Act (X. of 1889), His Excellency the Governor in Council is pleased to direct that the rates of port dues chargeable on any vessel entering a port in ballast, and not carrying passengers, shall be three-fourths of the rate laid down above.

In exercise of the powers conferred by section 47 of the Indian Ports Act (X. of 1889), His Excellency the Governor in Council is pleased to direct that when a vessel enters a port, but does not discharge or take in any cargo or passengers therein (with the exception of such unshipment and re-shipment as may be necessary for purposes of repair), she shall be charged with a port due at half the rate specified above.

In exercise of the powers conferred by sections 33 and 34 of the Indian Ports Act (X. of 1889), and in modification of Marine Department Notification No. 55, dated 10th June, 1889, published in page 390 of the *Fort Saint George Gazette*, dated 18th June, 1889, His Excellency the Governor in Council is pleased to notify that from and after the 1st January, 1890, the rate of port dues payable by foreign vessels calling at a single port in any of the undermentioned districts will be raised from two to three Annas a ton :—

Ganjam | Godaveri | Kistna | Tanjore | South Canara.

Instructions to Commanders of vessels visiting the Port of Madras.

(1) The Master of every inward or outward bound vessel, on arriving within signal distance of any signal station established within the limits of the port of Madras, shall, on the requisition of the pilot in charge of the vessel, signify the name of the vessel by hoisting the number by which she is known, or by adopting such other means to this end as may be practicable and usual, and shall keep the signal flying until it is answered from the signal-station.

If the Master of a vessel arriving, as aforesaid, offends against sub-section (1), he shall be punished for every such offence with a fine which may extend to one thousand Rupees.

Every pilot in charge of a vessel shall require the number of the vessel of which he is in charge to be duly signalled as provided by the last foregoing section.

(2) When on such requisition from the pilot to that effect, the Master of a vessel refuses to hoist the number of a vessel, or to adopt such other means of making her name known, as may be practicable and usual, the pilot may, on arrival at the first place of safe anchorage, anchor the vessel and refuse to proceed on his course until the requisition has been complied with.

Any pilot in charge of a vessel who disobeys, or abets, within the meaning of the Indian Penal Code, disobedience to any of the provisions of this chapter, shall be liable to a penalty not exceeding five hundred Rupees, for each instance of such disobedience or abetment, and, in addition, shall be liable to dismissal from his appointment.

Time Signals.

(a) The semaphore on the Port Officer's flagstaff is dropped at 1 o'clock P.M., corresponding to 19 hours, 39 minutes, 00·6 second, Greenwich mean time. A gun is fired at noon and 8 o'clock P.M. (Madras time).

(b) When the semaphore fails to drop or is not dropped correctly, signal C. V. N. J. of the Commercial Code will be hoisted immediately and kept flying for half an hour, in which case the semaphore will be dropped again at 2 P.M., corresponding to 20 hours 39 minutes, 00·6 second, Greenwich mean time.

Admission to General Hospital.

Sick seamen and others are admitted into the General Hospital at Madras for treatment under an order from the Deputy Conservator of the Port.

Matters relating to Harbour Masters.

Gratifications to Harbour Master.

Harbour Masters are forbidden to receive any gratification from Masters of vessels or others with whom they are brought in contact while in the execution of their duty; any gratuity given to a pilot will, if brought to notice, lead to his instant dismissal.

Applications for services of a Harbour Master.

(a) Applications for the service of a Harbour Master should be sent to the Deputy Conservator's office between the hours of 10 o'clock A.M. and 5 o'clock P.M. and the words "Application for a Harbour Master" should be written on the cover.

(b) The application for a Harbour Master from a vessel intending to proceed to sea on a Sunday or on any of the close holidays authorized by Government, should be sent to the Deputy Conservator's office the day previous.

(c) A vessel requiring a Harbour Master after dark should burn a blue light.

Delay in sending Harbour Master.

In the event of any delay having occurred in a Harbour Master being supplied to a vessel, an inquiry into the circumstance will be instituted on a report respecting the same being made to the Deputy Conservator of the Port.

Approaching the Harbour Entrance.

The entrance of the artificial harbour is not to be approached by vessels nearer than 10 fathoms of water by night and $9\frac{1}{2}$ fathoms by day, till the arrival of a pilot.

For regulating the Entry and Departure of Vessels.

Vessels about to leave the Harbour shall hoist Flag *N.* of the Commercial Code at the Fore.

Vessels about to enter the Harbour shall hoist Flag *P.* of the Commercial Code at the Fore.

When a Harbour Master on board a vessel outside the Harbour intending to enter sees the *N.* of the Universal Code at the mast-head of a vessel inside, he must wait outside until the vessel flying the *N.* has left the Harbour, if the *N.* is lowered to half-mast, he may then enter.

Particular Berths outside the Harbour.

For discharging Horses.

Vessels with a consignment of horses on board intending to discharge them outside the harbour, shall anchor in not less than 7 fathoms of water with the Madras Lighthouse bearing west, or west by south. No vessel shall anchor to the southward of the former bearing.

For taking in or discharging Timber.

A vessel while discharging timber shall take up such berth as will enable her to do so on the beach set apart for the purpose between Cassimode and the new boundary pillar and not elsewhere within the Port of Madras without the special permission of the Harbour Board.

Vessels taking in or discharging any other particular kind of cargo not herein-before mentioned, shall take up such berths as may be assigned to them by the Deputy Conservator.

For keeping the Harbour Entrance clear.

Vessels remaining outside the Harbour within the limits of the port are required to take up such a position that whichever way they may swing, they will be quite clear of the entrance of the harbour.

For Sailing Vessels other than Dhonies.

Sailing vessels other than dhonies shall in taking up a berth between the 1st January and the 14th April, and between the 16th June and the 30th September within the limits of the port, anchor in not less than 8 fathoms of water.

From the 15th of April to the 15th of June, and from the 1st of October to the 31st of December, no vessel which is not propelled by steam shall anchor in less than 9 fathoms of water.

Striking Yards and Masts.

From the 15th of April to the 15th of June, and from the 1st of October to the 31st of December, sailing vessels anchored within the limits of the port shall keep their top-gallant-masts struck.

Anchoring and Mooring.

Between the 1st January and the 14th April, and between the 16th June and the 30th September and also during the prevalence of strong landwinds and "north-western" vessels inside the harbour shall be moored with not less than 40 fathoms of chain on the riding cable.

In the event of a vessel parting her riding cable, it is necessary for vessels inside the harbour to have a third anchor ready for letting go without delay, and to have all arrangements made for meeting such an emergency with readiness and despatch, as the consequences attending the parting of the riding chain may be most disastrous.

Stern-fasts.

When a vessel is placed in moorings with a stern-fast, the commander of such vessel shall be prepared to slack away, without waiting for order to do so, such stern-fast, in time, so as to allow the vessel to ride with her head to the wind whenever the strength of the wind is such as to render the same necessary, and he shall also cause a careful watch to be kept on the stern-fast at all times and especially at night. In slacking away the sternfast, care must be taken to avoid colliding with any other vessel using a stern-fast.

Discharging Ashes, etc.

Ashes, clinkers and sweepings shall not be thrown overboard from vessels while in the harbour.

Fires and Lights.

All spirits, oil, paints and spirits of turpentine or other inflammable substances on board vessels within the port shall be stored in a place of security.

Discharging or taking in Gunpowder or other Explosives.

In loading or discharging gunpowder, ammunition or other explosives in excess of 100 lbs. in weight, the Master or other person in charge of the vessel shall be responsible that tanned hides or wadmiltits are laid over all portions of the vessel over which the barrels or cases pass, and also over all projections and on the platform in the hold; that a cushion (stuffed with white oakum) covered with leather is used for landing all barrels or cases upon, whether in the hold or on the deck: that the barrels or cases are carefully handled and stowed, and are on no account rolled over each other unless tanned hides are laid down for the purpose of protection: and after the gunpowder, ammunition or other explosives are stowed, the magazine and hatches leading thereto are properly secured and locked, and the key remains in his possession, and after the operation of discharging is completed, that the hides, hair cloths, etc. are removed and the hold or magazine is carefully cleaned out.

For the purposes of these rules, explosives shall be classified as follows, namely:—

| | |
|------------------------|---------------------|
| Class 1. Gunpowder. | Class 5. Fulminate. |
| „ 2. Nitrate-mixture. | „ 6. Ammunition. |
| „ 3. Nitro-compound. | „ 7. Fireworks. |
| „ 4. Chlorate-mixture. | |

When employed in shipping or discharging the explosives above-mentioned, no person shall wear boots or shoes with iron or steel nails, heels or tips.

As a general rule in landing and depositing or taking on board such excess quantity, no combustible stores shall be conveyed in the same hoy with powder and ammunition. In special cases, however, where combustible stores of an exceptionally safe description are forwarded with proper precaution as to their stowage and security, this restriction may be omitted.

Smoking and carrying lucifer matches on board lighters or boats conveying such gunpowder are strictly prohibited, and no fire will be allowed on board on any pretence whatever.

No fire is to be permitted in the barges, lighters or boats having on board or receiving such gunpowder or explosives.

Vessels, barges and boats having or taking on board such explosives are to be kept scrupulously clean and free from loose gunpowder.

No percussion caps, fuzes or other priming, by which gunpowder or other explosives may be exploded, shall be carried in a boat having such gunpowder or other explosives on board.

Ammunition and manufactured fireworks may be freely landed and shipped inside the harbour. Gunpowder may remain on board a ship in the harbour if secured in a properly constructed magazine approved by the Deputy Conservator or by an officer deputed by him, and may be landed and shipped under special sanction.

All other explosives are excluded from the harbour entirely.

Discharging of Guns in Port.

(Section 27 of the Indian Ports Act X. of 1889.)

Whoever, without lawful excuse, discharges any “fire-arm” in any port subject to this Act, or on or from any landing place, pier, wharf, or quay, thereof, except a gun loaded only with gunpowder for the purpose of making a signal of distress, or for such

other purpose, as may be allowed by the Local Government, shall, for every such offence, be punished with fine which may extend to fifty Rupees.

Report of Casualties to Shipping.

*(To be made in writing to the Conservator through the Deputy
Conservator by the Master.)*

Extract from Act V. of 1883 (the Indian Merchant Shipping Act, 1883).

“Whenever any Magistrate, or any officer appointed by the Local Government in this behalf, receives credible information that—

- (a) any ship has been lost, abandoned, stranded or materially damaged on or near the coasts of British India ; or
- (b) by reason of any casualty happening to or on board of, any ship on or near those coasts, loss of life has ensued ; or
- (c) any ship has caused loss or material damage to any other ship on or near those coasts ; or
- (d) any such loss, abandonment, stranding, damage or casualty has happened elsewhere to, on board of, any British ship, and any competent witnesses thereof have arrived or are to be found at any place in British India ; or
- (e) any British ship is supposed to have been lost and any evidence can be obtained in British India as to the circumstances under which she proceeded to sea or was last heard of ;

he shall forthwith report in writing the information to the Local Government.

In the cases mentioned in clauses (a), (b) and (c) the Master, pilot, harbour master, or other person in charge of the ship, or (where two ships are concerned) in charge of each ship, at the time of the loss, abandonment, stranding, damage, or casualty, and

In cases under clause (d) where the Master of the ship concerned, or (except in the case of a loss) where the ship concerned proceeds to any place in British India from the place where the loss, abandonment, stranding, damage or casualty has occurred, the Master of the ship shall, on arriving in British India, give immediate notice of the loss, abandonment, stranding, damage or casualty to the nearest Magistrate, or, when he arrives at a port in British India, to the officer appointed as aforesaid at that port.

“Any person bound to give notice under this section and wilfully failing to give the same shall be punished with fine which may extend to five hundred Rupees, and, in default of payment, to simple imprisonment for a term which may extend to three months.”

Extinguishment of Fires.

(Section 28 of the Indian Ports Act X. of 1889.)

If the Master of any vessel in which fire takes place while lying in any such port, wilfully omits to take order to extinguish fire, or obstructs the Conservator or the Port Officer, or any person acting under the authority of the Conservator or Port Officer, in extinguishing or attempting to extinguish the fire, he shall be punished with imprisonment which may extend to six months, or with fine which may extend to one thousand Rupees, or with both.

Vessel to be provided with Force Pump.

(Section 32 of the Indian Ports Act X. of 1889.)

“(1) Every vessel exceeding the burthen of two hundred tons and lying in any port to which this section has been specially extended, shall be provided with a proper force-pump and hose and appurtenances, for the purpose of extinguishing any fire which may occur on board.”

“(2) The Master of every such vessel who, having been required by the Conservator to comply with the provisions of sub-section (1), neglects or refuses, without lawful excuse, so to do for the space of seven days after such requisition, shall be punished with fine which may extend to five hundred Rupees.”

Searching for lost Stores.

(Section 29 of the Indian Ports Act X. of 1889.)

“(1) No person, without the permission of the Conservator, shall in any port subject to this Act creep or sweep for anchors, cables or other stores lost or supposed to be lost therein.”

“(2) If any person offends against the provisions of sub-section (1), he shall be punished with fine which may extend to one hundred Rupees.”

Removing Stones, etc.

(Section 30 of the Indian Ports Act X. of 1889.)

“(1) No person, without the permission of the Conservator, shall in any port subject to this Act remove or carry away any rock, stones, shingle, gravel, or soil, or any artificial protection from any part of the bank or shore of the port; and no person shall sink or bury in any part of such bank or shore, whether the same be public or private property, any mooring-post, anchor or any other thing, or do any other thing which is likely to injure, or to be used so as to injure, such bank or shore, except with the permission of the said Conservator, and with the aid or under the inspection of such person, if any, as he may appoint to take part in, or overlook the performance of such work.”

“(2) If any person offends against sub-section (1), he shall for every such offence be punished with fine which may extend to one hundred Rupees, and shall pay the expenses of repairing the injury (if any) done by him to such bank or shore.”

Regulations respecting Lights.

All vessels of whatever rig or denomination, when under weigh or at anchor, shall at night exhibit the lights ordered under the order of Her Majesty in Council, dated 1st July, 1897, and when moored in the harbour, shall further exhibit “where it can best be seen, but at a height not exceeding 20 feet above the hull, a bright white light, in a globular lantern not less than 8 inches in diameter, and so constructed as to show a clear, uniform, and unbroken light, visible all round the horizon at a distance of at least one mile.”

Bad Weather Arrangements.

During the prevalence of suspicious or threatening weather, the Commander of every vessel within the limits of the port is required to attend to the following directions:—

(a) Not to be absent from his vessel between sunset and sunrise.

- (b) To keep his vessel prepared in every respect to proceed to sea at short notice.
- (c) To leave the harbour without waiting for instructions to do so, should he deem such a course prudent.
- (d) On the hoisting of the danger signal, to take such other measures for securing the safety of his vessel as he may consider requisite, as no further instructions on that point will be furnished by the Port authorities. Should his vessel be inside the harbour, he is to proceed outside at once on this signal being hoisted without waiting for the special signal to do so.
- (e) In the event of wreck occurring, should it be observed that the rocket apparatus is not at once forthcoming, a line should be immediately sent on shore from the vessel by some kind of buoy, or other handy means, to which the tail block and double line will be attached by those on shore, or signals made, if possible, as to what other steps must be carried out.

Inattention to Directions of the Conservator.

(Clause (2) Section 8 of the Indian Ports Act X. of 1889.)

“If any person wilfully and without lawful excuse refuses or neglects to obey any lawful direction of the Conservator after notice thereof has been given to him, he shall, for every such offence, be punished with fine which may extend to one hundred Rupees, and with further fine which may extend to one hundred Rupees for every day on which after such notice as aforesaid, he wilfully and without lawful excuse continues to disobey the direction.”

Instructions to Commanders of Vessels visiting Coast-Ports.

Port Dues.

(Under sections 33 and 34 of the Indian Ports Act X. of 1889.)

Cargo and Passenger Boats.

- (a) No boats are to be detained alongside of a vessel after the “Re-call Signal” has been made.
- (b) Boatmen are not to be compelled or permitted either to work on board any vessel within the port, or to receive more passengers or cargo than is specified in the boat’s license.
- (c) Any irregular practice among the crews of boats or catamarans should be brought at once to the notice of the Conservator of the port.
- (d) No cargo is to be landed in ships’ boats without the special permission of the Conservator.
- (e) Communication with the shore through the surf in a ship’s boat is prohibited.

Fires and Lights.

All spirits, oil paints, and spirits of turpentine or other inflammable substances on board vessels within the port shall be stored in a place of security.

Extinguishment of Fires.

(*Section 28 of the Indian Ports Act X. of 1889.*)

If the Master of any vessel in which fire takes place, while lying in any such port, wilfully omits to take order to extinguish fire, or obstructs the Conservator or the Port Officer, or any person acting under the authority of the Conservator or Port Officer in extinguishing or attempting to extinguish the fire, he shall be punished with imprisonment which may extend to six months, or with fine which may extend to one thousand Rupees, or with both.

Discharging or taking in Gunpowder or other Explosives.

In loading or discharging gunpowder, ammunition, or other explosives in excess of 100 lbs. in weight, the Master or other person in charge of the vessel shall be responsible that tanned hides or wadmiltits are laid over all portions of the vessel over which the barrels or cases pass, and also over all projections and on the platform in the hold ; that a cushion (stuffed with white oakum) covered with leather is used for landing all barrels or cases upon, whether in the hold or on the deck ; that the barrels or cases are carefully handled and stowed, and are on no account rolled over each other unless tanned hides are laid down for the purpose of protection ; and after the gunpowder, ammunition or other explosives are stowed, the magazine and hatches leading thereto are properly secured and locked, and the key remains in his possession, and after the operation of discharging is completed, that the hides, hair cloths, etc., are removed and the hold or magazine is carefully cleaned out.

For the purposes of these rules, explosives shall be classified as follows, namely :

| | |
|------------------------|---------------------|
| Class 1. Gunpowder. | Class 5. Fulminate. |
| „ 2. Nitrate-mixture. | „ 6. Ammunition. |
| „ 3. Nitro-compound. | „ 7. Fireworks. |
| „ 4. Chlorate-mixture. | |

When employed in shipping or discharging the explosives above mentioned, no person shall wear boots or shoes with iron or steel nails, heels or tips.

As a general rule in landing and depositing or taking on board such excess quantity, no combustible stores shall be conveyed in the same hoy with powder and ammunition. In special cases, however, where combustible stores of an exceptionally safe description are forwarded with proper precaution as to their stowage and security, this restriction may be omitted.

Smoking and carrying lucifer matches on board lighters or boats conveying such gunpowder are strictly prohibited, and no fire will be allowed on board on any pretence whatever.

No fire is to be permitted in the barges, lighters or boats having on board or receiving such gunpowder or explosives.

Vessels, barges and boats having or taking on board such explosives are to be kept scrupulously clean and free from loose gunpowder.

No percussion caps, fuzes or other priming, by which gunpowder or other explosives may be exploded, shall be carried in a boat having such gunpowder or other explosives on board.

Discharging of Guns in Ports.

(Section 27 of the Indian Ports Act X. of 1889.)

Whoever, without lawful excuse, discharges any "firearm" in any port subject to this Act, or on or from any landing place, pier, wharf, or quay, thereof, except a gun loaded only with gunpowder for the purpose of making a signal of distress, or for such other purpose as may be allowed by the local Government, shall, for every such offence be punished with fine which may extend to fifty Rupees.

Searching for Lost Stores.

(Section 29 of the Indian Ports Act X. of 1889.)

"(1) No person without the permission of the Conservator, shall in any port subject to this Act creep or sweep for anchors, cables or other stores lost or supposed to be lost therein."

"(2) If any person offends against the provisions of sub-section (1) he shall be punished with fine which may extend to one hundred Rupees."

Removing Stones, etc.

(Section 30 of the Indian Ports Act X. of 1889.)

"(1) No person, without the permission of the Conservator, shall in any port subject to this Act remove or carry away any rock, stones, shingle, gravel or soil, or any artificial protection from any part of the bank or shore of the port; and no person shall sink or bury in any part of such bank or shore, whether the same be public or private property, any mooring-post, anchor or any other thing, or do any other thing which is likely to injure, or to be used so as to injure, such bank on shore, except with the permission of the said Conservator, and with the aid or under the inspection of such person, if any, as he may appoint to take part in, or overlook the performance of, such work."

"(2) If any person offends against sub-section (1), he shall for every such offence be punished with fine which may extend to one hundred Rupees, and shall pay the expenses of repairing the injury (if any) done by him to such bank or shore."

Regulations respecting Lights.

All vessels of whatever rig or denomination, when under weigh or at anchor, shall at night exhibit the lights ordered under the order of Her Majesty in Council, dated 1st July, 1897, and, when moored in the harbour, shall further exhibit "where it can best be seen, but at a height not exceeding 20 feet above the hull, a bright white light, in a globular lantern not less than 8 inches in diameter, and so constructed as to show a clear, uniform and unbroken light, visible all round the horizon at a distance of at least one mile."

Bad Weather Arrangements.

During the prevalence of suspicious or threatening weather, the Commander of every vessel within the limits of the port is required to attend to the following directions:—

(a) Not to be absent from his vessel between sunset and sunrise.

(b) To keep his vessel prepared in every respect to proceed to sea at short notice.

- (c) To leave the port without waiting for instructions to do so, should he deem such a course prudent.
- (d) On the hoisting of the Danger Signal, to take such other measures for securing the safety of his vessel as he may consider requisite, as no further instructions on that point will be furnished by the Port authorities.

Report of Casualties to Shipping.

(To be made in writing to the Conservator by the Master.)

Extract from Act V. of 1883 (the Indian Merchant Shipping Act, 1883.)

“Whenever any Magistrate, or any officer appointed by the Local Government in his behalf receives credible information that—

- (a) any ship has been lost, abandoned, stranded or materially damaged on or near the coasts of British India; or
- (b) by reason of any casualty happening to, or on board of, any ship on or near those coasts, loss of life has ensued; or
- (c) any ship has caused loss or material damage to any other ship on or near those coasts; or
- (d) any such loss, abandonment, stranding, damage or casualty has happened elsewhere to, or on board of, any British ship, and any competent witnesses thereof have arrived or are to be found at any place in British India; or
- (e) any British ship is supposed to have been lost, and any evidence can be obtained in British India as to the circumstances under which she proceeded to sea or was last heard of;

he shall forthwith report in writing the information to the Local Government.

“In the cases mentioned in clauses (a), (b) and (c), the master, pilot, harbour master, or other person in charge of the ship, or (where two ships are concerned) in charge of each ship, at the time of the loss, abandonment, stranding, damage, or casualty, and

in cases, under clause (d), where the Master of the ship concerned, or (except in the case of a loss) where the ship concerned proceeds to any place in British India from the place where the loss, abandonment, stranding, damage or casualty has occurred, the master of the ship

shall, on arriving in British India, give immediate notice of the loss, abandonment, stranding, damage or casualty to the nearest Magistrate, or, when he arrives at a port in British India, to the officer appointed as aforesaid at that port.

“Any person bound to give notice under this section and wilfully failing to give the same shall be punished with fine which may extend to five hundred Rupees, and, in default of payment, to simple imprisonment for a term which may extend to three months.”

Inattention to Directions of the Conservator.

(Clause (2), Section 8, of the Indian Ports Act X. of 1889.)

“If any person wilfully and without lawful excuse refuses or neglects to obey any lawful direction of the Conservator after notice thereof has been given to him, he shall, for every such offence, be punished with fine which may extend to one hundred Rupees, and with further fine which may extend to one hundred Rupees for every day on which, after such notice as aforesaid, he wilfully and without lawful excuse continues to disobey the direction.”

Port Signals.

The following are the established signals of the Port

(Section 70, Act X., of 1889) :—

[The Flags specified belong to the Commercial Code.]

Ordinary Day and Night Signals.

- | | |
|--|--|
| (a) Boat Muster Flag | A square blue Flag with four parallel red bars running acrosswise. |
| (b) Quarantine Flag | R. |
| (c) When the state of the surf renders communication with the shore dangerous. | Flag M. |
| (d) When the surf is impassable | Flag K. |
| (e) In case of fire (by ship) | By day—The red Ensign hoisted, union downwards, at the Main. By night—one red light at Main. |
| (f) In case of parting riding cable (by ship). | By day—Flag B hoisted over the red Ensign, union downwards, at Main. By night—Two red lights at Main, hoisted vertically. |
| (g) In case of stern-fast (by ship). | By day—Flag J under the red Ensign at peak. By night—One red over one white light at peak. |
| (h) In case of any other emergency or duties (by ship). | By day—Red Ensign union downwards at peak. By night—One white light over one red light at peak. |
| (i) For a doctor (by ship). | By day—Flag H at Main. By night—one white light—one red light—one white light hoisted vertically at Main. |
| (j) For a police boat (by ship). | By day—The Union Jack hoisted under the red Ensign at peak. By night—Three white lights hoisted vertically at peak. |
| (k) For an accommodation boat (by ship). | By day—Flag D at Main. By night—Three white lights hoisted horizontally 4 feet apart at peak. |
| (l) For a catamaran (by ship). | By day—Flag G at Main. By night—Two white lights hoisted horizontally 4 feet apart at peak. |
| (m) General recall for boats | Flag S at Port Office Flagstaff. |
| (n) Vessels about to leave the harbour | To hoist Flag N at the Fore. |
| (o) Vessel about to enter the harbour | To hoist Flag F at the Fore. |

(p) To signify a death having occurred on board, and while a dead body remains on board.

The ship's Ensign and House Flag half-mast between sunrise and sunset.

One red light at the Ensign staff at night hoisted half-way.

(q) To signify that a double crew is necessary in each boat.

Flag P at Port Flagstaff.

Storm Signals.

| | | | | | | | | |
|--------|---|----------------|---|-------------------------|---|------------|---|------------------|
| Flag L | { | when hoisted | { | signifies that cyclonic | { | when | { | that cyclonic |
| | | at northern | | weather prevails on | | hoisted at | | weather prevails |
| | | arm of yard | | coast between Masuli- | | southern | | near Negapatam. |
| | | on Port Office | | patam and Gopaul- | | arm, | | |
| | | Flagstaff, | | pore; | | | | |

I. *The Warning Signal*.—During the prevalence of suspicious or threatening weather; or on the "Warning Signal" being hoisted,

DAY.—A ball.

NIGHT.—Three white lights arranged in a vertical line.

Commanders of vessels at anchor within the limits of their

port are required to attend to the following directions:—

(a) Not to be absent from their respective vessels between sunset and sunrise.

(b) To keep their respective vessels prepared in every respect to proceed to sea at short notice.

NOTE.—The ball or three white lights when hoisted indicates that a cyclonic storm has formed, which will probably advance to the part of the coast on which the port is situated, but is still at a considerable distance from it.

II. *The Danger Signal*.—On this signal being hoisted, the Commander of each vessel will take such further measures for securing the

Danger Signal.

DAY.—A drum.

NIGHT.—Two white lights arranged in a vertical line.

safety of his vessel as he may consider requisite without waiting for instructions from the Port Officer on that point.

NOTE.—The drum or two white lights when hoisted indicates that a storm is approaching that part of the coast on which the port is situated, and will shortly cross it.

III. (1) The warning and danger signals according as they are hoisted at the northern or southern arm of the yard of the Port Flagstaff, indicate that the storm is expected to strike the coast to the north or south of the port, and when hoisted at gaff attached to the flagstaff that the centre of the storm is expected to pass over the port.

(2) The intensity of the storm will be indicated during daylight by additional balls of a size half the diameter of the ball used as a warning signal, hoisted to the same yard-arm as the warning or danger signal, but between it and the flagstaff, in the case of a storm passing to the north or south of the port, and by these balls being hoisted over the danger or warning signal when the storm is expected to pass over the port; thus one small ball will indicate a storm of slight intensity, two small balls a storm of considerable intensity.

Scale of Fees for measuring and surveying Vessels.

Applicable to all Ports.

| | Rs. | | Rs. |
|------------------------------------|-----|-------------------------------------|-----|
| Under 50 tons | 7 | 200 tons and under 250 tons | 23 |
| 50 tons and under 100 tons | 11 | 250 " 300 " | 27 |
| 100 " 150 " | 15 | 300 tons and upwards | 30 |
| 150 " 200 " | 19 | | |

Scale of Pilotage Fees at the Port of Cochin.

(Government Notification, Fort St. George Gazette, 6th March, 1877).

I.—For every vessel of any burden exceeding 100 tons, but not exceeding 200 tons—

| | | Per foot. | | |
|-----|--|-----------|-----|----|
| | | Rs. | As. | P. |
| (a) | Drawing 4 feet and over 3 feet of water. | 0 | 10 | 0 |
| (b) | " 5 " 4 " | 0 | 11 | 0 |
| (c) | " 6 " 5 " | 0 | 13 | 0 |
| (d) | " 7 " 6 " | 0 | 15 | 0 |
| (e) | " 8 " 7 " | 1 | 4 | 0 |
| (f) | " 9 " 8 " | 1 | 9 | 0 |
| (g) | " 10 " 9 " | 1 | 14 | 0 |
| (h) | " 11 " 10 " | 2 | 8 | 0 |
| (i) | " 12 " 11 " | 3 | 2 | 0 |
| (j) | " 13 " 12 " | 3 | 12 | 0 |

(The draught of water will be calculated upon a whole foot; *e.g.*, a vessel drawing 3½ feet will be charged at 4 feet, or 2 Rupees 8 Annas, and one drawing less than 3½ feet, at 3 feet, or 1 Rupee 14 Annas).

II.—(a) For every vessel whose burden exceeds 200 tons, but does not exceed 400 tons Rs. 30

(b) For every vessel whose burden exceeds 400 tons, but does not exceed 600 tons 40

(c) For every vessel whose burden exceeds 600 tons 50

Scale of Pilotage Fees at the Port of Pamban.

(G. O., Marine, No. 196, of 4th June, 1875).

| | | Per foot. | | |
|---|--|-----------|-----|----|
| | | Rs. | As. | P. |
| Upon all vessels drawing 3 feet water and under | | 0 | 9 | 0 |
| " " " 4 feet and over 3 feet | | 0 | 10 | 0 |
| " " " 5 " 4 " | | 0 | 11 | 0 |
| " " " 6 " 5 " | | 0 | 13 | 0 |
| " " " 7 " 6 " | | 0 | 15 | 0 |
| " " " 8 " 7 " | | 1 | 4 | 0 |
| " " " 9 " 8 " | | 1 | 9 | 0 |
| " " " 10 " 9 " | | 1 | 14 | 0 |
| " " " 11 " 10 " | | 2 | 8 | 0 |
| " " " 12 " 11 " | | 3 | 2 | 0 |
| " " " 13 " 12 " | | 3 | 12 | 0 |

The draught will be calculated in even feet, a vessel of 3½ feet being charged at 4 feet, or 2 Rupees 8 Annas, and one of less than 3½ feet at 3 feet, or 1 Rupee 11 Annas.

Scale of Charges for the Pamban Channels.

(G. O., Marine, No. 196, of the 4th June, 1875.)

| | Fine weather. | | | Foul weather or strong current. |
|---|---------------|-----|----|------------------------------------|
| | Rs. | As. | P. | |
| Hire of warps | 1 | 0 | 0 | — |
| Hire of grapnel | 1 | 0 | 0 | — |
| Warping canoe with 5 men | 1 | 14 | 0 | 2 4 0 |
| Extra men for one tide | 0 | 3 | 0 | 0 5 0 |
| Do. if a longer period, for every eight hours | 0 | 4 | 0 | 0 6 0 |

Pilotage Charge for Kelakary Channel.

(Government Notification, *Fort St. George Gazette*, 1st August, 1854.)

Annas per foot of a vessel's draught.

Port Rules of the Port of Madras.

I.—Entering or Leaving Port, Clause (a).

(a) All sea going vessels, on entering or leaving the port between sunrise and sunset, shall fly their national flag, and, when entering port, each vessel shall show her number.

(b) No vessel shall enter or leave the harbour between the hours of 6 p.m. and 6 a.m. without special authority from the Deputy Conservator of the Port; and no vessel shall enter or leave the harbour at any time without having on board a Harbour Master, unless authority in writing so to do has been obtained from the Deputy Conservator.

(c) Not more than one vessel shall enter or leave the harbour at the same time.

II.—Berths of Vessels—Clause (b).

All vessels within the Port shall take up such berths as may be assigned them by the Deputy Conservator, and shall change their berth, or remove, when required by him.

III.—Striking yards and Masts—Clause (c).

All vessels within the port shall strike their yards and top-masts on being required to do so by the Deputy Conservator whether by signal or otherwise.

IV.—Removal and placing of Anchors, &c.—Clause (d).

Anchors shall not be allowed to remain cock-billed nor spare spars be allowed to hang alongside or astern of any vessel.

V.—Taking in or discharging passengers, ballast or any particular kind of cargo, and the stations to be occupied by vessels whilst so engaged, Clause (e).

(a) Ammunition or other explosives, kerosine-oil and timber shall be taken in and discharged only at such stations as may be set apart from time to time by the Conservator to be occupied by vessels whilst so engaged.

(b) Ballast and rubbish shall not be thrown overboard within the limits of the port without the special permission of the Deputy Conservator.

VI.—Keeping Free Passages, etc.—Clause (f).

The entrance to the harbour, the spaces between the different moorings within the harbour, the spaces in the vicinity of the pier and the harbour walls, shall be kept clear to the extent that may be required by the Deputy Conservator.

VII.—Anchoring and Mooring—Clause (g).

(a) Vessels within the port lying at single anchor shall have a second anchor ready to be let go.

(b) Vessels when moored or at single anchor shall have ranges of both cables on deck ready to be veered immediately.

(c) All vessels within the harbour should be moored in such a manner as may be directed by the Deputy Conservator and with or without sternfasts at his discretion.

(d) All anchors must be buoyed, and care taken that the buoys "watch."

(e) When a steam vessel entering the harbour is provided with stockless anchors only, or with anchors and chains which, in the opinion of the Deputy Conservator of the Port, are unsuitable for mooring such vessel inside the harbour, the Master shall, unless permission to the contrary is given by the Deputy Conservator in writing, keep sufficient steam at all times available in the main boilers of such vessel for moving her from her berth within one hour from receiving notice, either written or verbal, so to do, from either the Deputy Conservator of the Port or the Senior Harbour Master on his behalf.

VIII.—Moving and Warping—Clause (h).

(a) All vessels within the port shall be moved or warped from place to place as required, and by such means or appliances as may be ordered by the Deputy Conservator.

(b) No vessel shall cast off a warp that has been made fast to her to assist a vessel moving, without being required to do so by the Harbour Master or officer in charge of the vessel moving.

IX.—Cargo Boats—Clause (k).

The plying of catamarans, flats, cargo, passenger and other boats, whether for hire or not, and whether regularly or only occasionally, in, or partly within and partly without the port, and the quantity of cargo or number of passengers to be carried by any such vessel, shall be subject to such regulations as may be laid down from time to time by the Conservator.

X.—Fires and Lights—Clause (l).

(a) No vessel shall be fumigated except at a place appointed by the Deputy Conservator for the purpose.

(b) Pitch or dammer shall not be heated on board vessels within the port, but in a boat alongside or astern; nor shall spirits be drawn off on board such vessels by candle or other unprotected artificial lights.

(c) Vessels while loading cotton shall not have any unprotected light in the hold or orlop.

(d) When gunpowder, ammunition or other explosives in excess of 100 lbs. weight are being shipped on board, or being discharged from any vessel within the limits of the port, neither fires, light nor smoking are under any circumstances to be permitted on board.

XI.—Signal Lights—Clause (m).

The Master of any vessel arriving within the port with ammunition, explosives, or over 100 lbs. in weight of gunpowder on board as cargo, shall display a red flag B of the Commercial Code at the fore during day-light, and between sun-set and sun-rise shall exhibit, when at anchor, a red light over the usual anchor light for such time as the ammunition, explosives or gunpowder may be on board within port limits.

The use of "sound signals" for attracting attention is prohibited on board vessels while within the limits of the port, except for the purposes specified in Articles 12 and 19 of the Board of Trade "Regulations respecting lights and fog-signals and steering and sailing rules" republished below, and in case of emergency where assistance from the shore is urgently required in the interest of the safety of the vessel.

Article 12.—A steam-ship shall be provided with a steam whistle or other efficient steam sound signal, so placed that the sound may not be intercepted by any obstructions, and with an efficient fog-horn to be sounded by a bellows or other mechanical means and also with an efficient bell. A sailing ship shall be provided with a similar fog-horn and bell.

In fog, mist, or falling snow, whether by day or night, the signals described in this article shall be used as follows ; that is to say :—

(a) A steam-ship under way shall make with her steam whistle, or other steam sound signal, at intervals of not more than two minutes, a prolonged blast.

(b) A sailing-ship under way shall make with her fog-horn, at intervals of not more than two minutes, when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession.

(c) A steam-ship and a sailing-ship when not under way, shall at intervals of not more than two minutes ring the bell.

* * * * *

Article 19.—In taking any course authorized or required by these Regulations, a steam-ship under way may indicate that course to any other ship which she has in sight by the following signals on her steam whistle, viz. :—

One short blast to mean “ I am directing my course to starboard ” ;

Two short blasts to mean “ I am directing my course to port ” ;

Three short blasts to mean “ I am going full speed astern.”

The use of these signals is optional ; but if they are used, the course of the ship must be in accordance with the signals made.

XII.—Number of Crew—Clause (n).

All vessels within the port shall have on board a sufficient number of crew to perform any duties which may become necessary for the safety of the vessel in regard to veering or heaving in cable, bracing up the yards, striking mast and yards, etc., in case of emergency arising.

XIII.—Employment of person engaged in cleaning or painting vessels, etc.—Clause (o).

No person shall be employed in cleaning or painting a vessel or in working in the bilges, boilers, or double bottom of a vessel in the port either before or after the hours which may be fixed from time to time by the Conservator for such purposes.

XIV.—Action to be taken by the Master when there is disease or sickness or a dead body on board his vessels while such vessel is within the limits of the port—Clause (p)

PART I.—REGULATIONS IN CASES OF CHOLERA, SMALL-POX OR OTHER EPIDEMIC DISEASES, COMMON IN INDIA.

(a) The Master of every vessel, on board of which there is, either among the passengers or crew, any case of cholera, small-pox, or other epidemic disease, common in India, shall report every such case to the pilot or other boarding officer, at the earliest opportunity, or, in the absence of a pilot or other boarding officer, or if the vessel be at anchor within port limits when such disease first breaks out, shall hoist a signal, which shall be, during the day, flag R of the Commercial Code at the main, and during the night, two white lights, one over the other, at the fore.

This is a square red flag with a yellow
St. George's Cross.

(b) The Master of every such vessel shall not allow any passenger suspected of having any such disease, to depart from such vessel before such vessel has been inspected by the Health Officer, but where the disease or diseases in question is or are limited to two cases, the vessel will not be prohibited from taking up the usual place of anchorage in the harbour, and passengers not suspected of having any such disease need not be detained on board pending the inspection of the Health Officer.

Where, however, cases of any such disease have been more numerous than two, or when from their occurring on pilgrim or emigrant ships, or for other special reasons further precautions may be deemed advisable, the Master shall anchor the vessel in the place appointed for the purpose; and shall not allow any of the passengers to leave the vessel until the Health Officer has made his inspection, and the Master of such vessel shall, moreover, cause her to be

thoroughly cleansed and fumigated under the directions of the Health Officer.

PART II.—REGULATIONS WHERE A DEATH HAS OCCURRED.

(a) On a death occurring during the day on board of a vessel in port, the ensign and house flag are to be immediately lowered half-mast, and kept in such position from sunrise to sunset as long as the body remains on board. Should a death occur between sunset and sunrise, one red light is to be hoisted at the peak, half-mast.

(b) The Master of the vessel will cause the death of any person on board to be made known at once to the Deputy Commissioner of Police, either by letter or otherwise, and shall also forward to the Deputy Conservator of the port a written report as as soon as possible after the occurrence in which all the circumstances attending the death are to be fully detailed.

(c) No dead body is to be removed from the ship without the permission of the Police authorities, unless the special permission of the Commissioner of Police to its interment on shore shall have been obtained, a dead body shall be buried in the sea, outside the harbour, in not less than 9 fathoms water, in such manner as shall ensure its sinking at once and remaining below water.

Note.—Every person committing a breach of any of the above rules, and for the punishment of disobedience to which express provision has not been made in Act X of 1889, will be liable to fine which may extend up to one hundred Rupees under the provisions of section 54 of the Act.

Special notice to Commanders of Vessels visiting the Port of Madras.

The following arrangements have been made for acquainting by signal the Commanders of vessels in port, with the "daily weather report" supplied to the Presidency Port Officer by the Meteorological Reporter to the Government of Bengal, viz. :—

I. Immediately after the one o'clock p.m. "time signal" has been made, flag *W* of the Commercial Code will be exhibited at the mast head of the Port Office Flagstaff, and will denote that the flags which may be hoisted at the yard-arm of the flagstaff while it remains in position have a meteorological meaning.

II. When the signal has been completed, its meaning will be found on referring to the accompanying copy of the Meteorological Code and the General Chart of the Bay of Bengal.

III. The ordinary Commercial Code signal flags (*B. to W. inclusive*) will be used in making the signal.

IV. Four flags will be used, and will be hoisted singly at one of the yard-arms of the flagstaff.

V. Each flag will have a special signification as to the weather in the Bay, as indicated in the Code, viz. :—

(a) The first flag will refer to section 1 of the Bay (*i.e.*) off Burmah and Arakan Coasts to longitude 90° E.

(b) The second flag to section 2 of the Bay (*i.e.*) at the head of the Bay north of latitude $19^{\circ} 30'$ N.

(c) The third flag to section 3 of the Bay (*i.e.*) off Ganjam, Circars, Coromandel Coast to longitude 90° E.

(d) The fourth flag to section 4 of the Bay (*i.e.*) the southern part of the Bay off the South Madras Coast, south of latitude $13^{\circ} 30'$ N.

VI. As the different flags are hoisted, the answering pennant of each vessel should be hoisted, and as each flag is hauled down, the answering pennant should be dipped and not lowered altogether until the signal has been completed.

VII. Each flag will be kept hoisted for a few minutes unless answered by all vessels in harbour before that time, in which case it will be hauled down.

Meteorological meaning of the Commercial Code Flags.

| Flag. | Weather. | Winds. | Sea. |
|-------|--------------------|---|----------------------------------|
| B | Fine weather . . . | Light or moderate winds, of direction about usual for the season. | Calm or slight sea. |
| C | Fine weather . . . | Moderate to strong wind, of direction about usual for the season. | Probably slight to moderate sea. |
| D | Fine weather . . . | Strong winds, of direction about usual for the season. | Probably moderate to rough sea. |
| F | Fine weather . . . | Light or moderate winds, of rather abnormal direction. | Calm or slight sea. |
| G | Fine weather . . . | Moderate to strong winds, of rather abnormal direction. | Probably slight to moderate sea. |
| H | Fine weather . . . | Strong winds, of rather abnormal direction. | Probably moderate to rough sea. |
| J | Fine weather . . . | Light or moderate winds, which apparently form part of a whirl or cyclonic circulation of winds. | Calm or slight sea. |
| K | Fine weather . . . | Moderate to strong winds, which apparently form part of a whirl or cyclonic circulation of winds. | Probably slight to moderate sea. |

| Flag. | Weather. | Winds. | Sea. |
|-------|---|---|----------------------------------|
| L | Doubtful weather . . . | Strong winds, which apparently form part of a whirl or cyclonic circulation of winds. | Probably moderate to rough sea. |
| M | Unsettled and suspicious weather. | Light or moderate winds, of rather abnormal direction. | Calm or slight sea. |
| N | Unsettled and suspicious weather. | Moderate to strong winds, of rather abnormal direction. | Probably slight to moderate sea. |
| P | Unsettled, suspicious and probably squally weather. | Strong winds, of rather abnormal direction. | Probably moderate to rough sea. |
| Q | Unsettled and suspicious weather. | Light or moderate winds, which apparently form part of a whirl or cyclonic circulation of winds. | Calm or slight sea. |
| R | Unsettled and suspicious weather. | Moderate to strong winds, which apparently form part of a whirl or cyclonic circulation of winds. | Probably slight to moderate sea. |
| S | Unsettled, suspicious and probably squally weather. | Strong winds, which apparently form part of a whirl or cyclonic circulation of winds. | Probably moderate to rough sea. |
| T | Unsettled and suspicious weather, which it is expected may lead to the formation of a cyclonic storm or stormy weather in the section of the Bay referred to. | Moderate or strong winds. | |
| V | Conditions indicate that a small storm at present of slight intensity has formed or is forming in the section of the Bay referred to. | Strong winds. | Probably moderate to rough sea. |
| W | Conditions indicate that a cyclonic storm has formed in the section of the Bay referred to and has commenced to move from the place of formation. | Strong winds. | |

Port Rules for all the Coast Ports of the Madras Presidency.

(Under section 6 of the Indian Ports Act X. of 1889).

I.—Entering or leaving Port—Clause (a).

(a) All sea-going vessels, on entering or leaving the port between sunrise and sunset, shall fly their national flag, and when entering port, each vessel shall show her number.

* (b) No vessels shall enter or leave the harbour between the hours of 6 p.m. and 6 a.m. without special authority from the Conservator of the Port.

II.—Berths of Vessels—Clause (b).

All vessels within the port shall take such berths as may be assigned them by the Conservator, and shall change their berth, or remove, when required by him.

III.—Striking Yards and Masts—Clause (c).

All vessels within the port shall strike their yards and top-masts on being required to do so by the Conservator, whether by signal or otherwise.

IV.—Taking in or discharging Ballast or any particular kind of Cargo.—Clause (e).

(a) All vessels taking in or discharging ballast or any particular kind of cargo, such as ammunition or other explosives, kerosine-oil, bones, coral or other offensive articles and timber within the limits of the port, shall do so only at such stations as may be set apart from time to time by the Conservator.

(b) Ballast and rubbish shall not be thrown overboard within the limits of the port without the special permission of the Conservator.

V.—Keeping free Passages—Clause (f).

A free passage shall be kept to all landing places, wharves and anchorages in accordance with such directions as may be issued on the subject by the Conservator, and all vessels shall move when required by the Conservator to clear such passages.

VI.—Anchoring and Mooring—Clause (g).

(a) All vessels within the port shall be anchored or moored in such manner as may be directed by the Conservator.

(b) The anchors of all steamers and square-rigged vessels must be buoyed, and care taken that the buoys "watch."

VII.—Moving and Warping—Clause (h).

(a) All vessels within the port shall be moved or warped from place to place as required, and by such means and appliances as may be ordered by the Conservator.

(b) No vessel shall cast off a warp that has been made fast to her to assist a vessel moving without being required to do so by the officer in charge of the vessel moving.

* Applies only to the ports of Cochin and Mangalore.

VIII.—Cargo Boats—Clause (k).

The plying of catamarans, flats, cargo, passenger and other boats, whether for hire or not, and whether regularly or only occasionally, in, or partly within and partly without, the port, and the quantity of cargo or number of passengers to be carried by any such vessel, shall be subject to such regulations as may be laid down from time to time by Government, and owners of such boats shall be subject to the control of the Conservator, and shall carry out at all times all orders issued by him in connection with the plying of their boats and which are not inconsistent with the regulations issued by Government.

IX.—Fires and Lights—Clause (l).

(a) No vessel shall be fumigated except at a place appointed by the Conservator for that purpose.

(b) Pitch or dammer shall not be heated on board vessels within the port, but in a boat alongside or astern; nor shall spirits be drawn off on board such vessels by candle or other unprotected artificial lights.

(c) Vessels while loading cotton shall not have any unprotected lights in the hold or orlop.

(d) When gunpowder, ammunition or other explosives in excess of 100 lbs. weight are being shipped on board, or being discharged from any vessel within the limits of the port, neither fires, lights nor smoking are under any circumstances to be permitted on board.

X.—Signal Lights—Clause (m).

The Master of any vessel arriving within the port with ammunition, explosives, or over 100 lbs. in weight of gunpowder on board as cargo, shall display a red flag *B* of the Commercial Code at the fore during day-light, and between sunset and sunrise shall exhibit, when at anchor, a red light over the usual anchor light for such time as the ammunition, explosives or gunpowder may be on board within port limits.

XI.—Number of Crew—Clause (n).

All vessels within the port shall have on board a sufficient number of crew to perform any duties which may become necessary for the safety of the vessel in regard to veering or heaving in cable, bracing up the yards, striking masts and yards, etc., in case of emergency arising.

*XII.—Employment of persons engaged in cleaning or painting Vessels, etc.—
Clause (o).*

No person shall be employed in cleaning or painting a vessel or in working in the bilges, boilers or double bottom of a vessel in the port either before or after the hours which may be fixed from time to time by the Conservator for such purposes.

*XIII.—Action to be taken by the Master where there is Disease or Sickness,
or a dead body on board his vessel while such vessel is within the
limits of the Port—Clause (p).*

**PART I.—REGULATIONS IN CASES OF CHOLERA, SMALL-POX, OR OTHER EPIDEMIC
DISEASES COMMON IN INDIA.**

(a) The Master of every vessel on board of which there is, either among the passengers or crew, any cases of cholera, small-pox or other epidemic disease common in

India, shall report such case or cases to the pilot or other boarding officer at the earliest opportunity, or, in the absence of a Harbour Master or other boarding officer, or if the vessel be at anchor within port limits when such disease first breaks out, shall hoist a signal which shall be during the day, Flag R of the Commercial Code at the main, and during the night, two white lights, one over the other, at the fore.

This is a square red flag with a yellow St. George's Cross.

(b) Where the disease or diseases in question are limited to one or two cases, the vessel will not be prohibited from taking up the usual place of anchorage within port limits and the passengers need not be detained on board pending the inspection of the Health Officer; but the Master of the vessel will be held responsible that no passenger suspected of having such disease is allowed to depart before this inspection.

(c) Where cases have been more numerous than one or two, or when from their occurring on pilgrim or emigrant ships, or for other special reasons, further precautions may be deemed advisable, the vessel shall take up such position as the Conservator of the port may direct; and none of the passengers shall be allowed to leave until the Health Officer has made his inspection.

(d) Vessels coming under this last rule shall be thoroughly cleaned and fumigated under the directions of the Health Officer.

PART II.—REGULATIONS WHERE A DEATH HAS OCCURRED.

(a) On a death occurring during the day on board of a vessel in the port, the ensign and house flag are to be immediately lowered half-mast and kept in such position from sunrise to sunset so long as the body remains on board. Should a death occur between sunset and sunrise, one red light is to be hoisted at the peak, half-mast.

(b) The Master of the vessel will cause the death of any person on board to be made known at once to the Conservator, either by letter or otherwise, and shall also forward to the Conservator a written report as soon as possible after the occurrence, in which all the circumstances attending the death are to be fully detailed.

(c) No dead body is to be removed from the ship without the permission of the Conservator. Unless the special permission of the Conservator to its interment on shore shall have been obtained, a dead body shall be buried in the sea, outside the limits of the port and in not less than 9 fathoms water, in such manner as shall ensure its sinking at once and remaining below water.

Note.—Every person committing a breach of any of the above rules and for the punishment of disobedience to which express provision has not been made in Act X. of 1889, will be liable to a fine which may extend up to one hundred Rupees under the provisions of section 54 of that Act.

At such of the ports specified where there is no Health Officer or pilot, the duties of those officials as laid down in the rules now published shall be carried out by the Conservator of the Port.

Additional Rules for the Port of Cocanada.

1. No vessel, whilst in the Cocanada river within the limits of the port, shall be allowed to have any naked or unprotected lights on board.

2. No person shall fire any rocket or other firework from any vessel that is in the Cocanada river and within the limits of the port, or from any boat, raft, landing place, pier, wharf, quay, or other place in such river, or upon any bank thereof within the limits of the port.

Signals for Boats at Ports in the Madras Presidency.

Flag S—All boats to return at once to the harbour or landing place.

Flag K—Surf is impassable.

Flag M—Communication with the shore dangerous.

Flag N—Boats can leave the harbour.

Flag F—Boats cannot enter the harbour.

Schedule of Boat-hire Rates.

Madras.

Cargo Boats.

The maximum rates of boat and catamaran hire, and the amount of goods and number of passengers which constitute a boat-load, as sanctioned by Government under Act X. of 1889, are specified in the annexed Schedules *A* and *B*.

Note.—In this connection attention is drawn to paragraph 17 of the Boat Rules passed by the Madras Government and provisions of section 6, clause *k*, of Act X. of 1889, which runs as follows:—

“No registered boat shall ply in fine weather if loaded with passengers or cargo beyond the number or quantity specified in the license granted in respect of such boat, or in rough weather with a greater number or quantity than that authorized for the occasion by the Registering Officer; all persons shall, on being required so to do by the tindal or owner of a registered boat, leave the boat, or, as the case may be, remove therefrom such quantity of cargo which such person shall have placed, or shall have caused to be placed, in such boat as the tindal or owner shall require him to remove if the number of passengers or quantity of cargo then in such boat shall exceed the number or quantity, as the case may be, allowed by this rule.”

Large pier boats shall not carry more than the ascertained quantity of goods according to their size and measurement as expressed in the licenses granted under Act X. of 1889.

Passengers may be carried in the pier boats only in cases of emergency and then in such numbers as the Deputy Conservator may decide.

No boats shall remain alongside a ship after 6 P.M. if ordered to return by the Deputy Conservator, and Commanders of vessels are prohibited from forcibly detaining boats after that hour.

Boatmen and catamaranmen shall not be compelled nor permitted either to work on board any vessel within the port or to receive more passengers or cargo than is laid down as a boat-load in the accompanying Schedule.

Any irregular practices among the crew of boats or catamarans shall be brought to the notice of the Deputy Conservator.

Communication with the shore through the surf in a ship's boat is prohibited.

Under the provisions of boat rules sanctioned by the Madras Government on the 16th November, 1891, the number of passengers and the quantity of goods which shall

constitute a boat-load within the meaning of section 6, clause *k*, of Act X. of 1889, are declared to be as follows :—

SCHEDULE A.

Inside the Harbour.

Maximum Masula Boat-load.

Dead weight, 3 tons, not damageable by water.

Rice, sugar, grain and ginger, 30 bags.

General cargo, 2 tons, by measurement of 50 cubic feet per ton.*

Outside the Harbour.

Maximum Masula Boat-load.

Dead weight, 2 tons not damageable by water.

Rice, sugar, grain and ginger 25 bags.

General cargo, 2 tons, by measurement of 50 cubic feet per ton.

Number of Adult Passengers composing a Masula Boat-load.

Europeans 12 persons. | Natives 15 persons.
N.B.—Two children to be considered equal to one adult.

Number of Adult passengers composing a Jolly Boat-load.

Europeans 5 persons. | Natives , . . . 8 persons.

GOODS.—Large pier boats shall carry the ascertained practicable quantity of goods according to their size and measurement, as expressed in the licenses granted under Act X. of 1889.

PASSENGERS.—Passengers are not to be carried in the pier boats excepting in cases of emergency, and then only in the proportion of one adult to a ton.

Under the provisions of Boat Rules the following maximum rates have been prescribed for the hire of boats and catamarans employed in the Madras Port :—

SCHEDULE B.

Maximum Rate of Boat and Catamaran Hire for the Port of Madras to and from ships of all descriptions lying at anchor in the outer roadstead of the Port of Madras.

Accommodation Boats.

| | Rs. | As. | P. | | Rs. | As. | P. |
|---------------------------|-----|-----|----|--------------------------|-----|-----|----|
| Ordinary trip | 3 | 8 | 0 | Trip in foul weather . . | 6 | 0 | 0 |
| Trip beyond 9 fathoms . . | 5 | 0 | 0 | Transhipment | 1 | 0 | 0 |

* During foul weather or rough surf 25 per cent. less to be carried in the case of general cargo, and during fine weather and smooth sea an addition of 50 per cent. may be carried with permission from the Deputy Port Conservator.

Common Boats.

| | To vessels in 4 fathoms or upwards. | | | To native craft under 4 fathoms. | | |
|---|---|-----|----|--|-----|----|
| | Rs. | As. | P. | Rs. | As. | P. |
| Ordinary trip* | 2 | 8 | 0 | 1 | 8 | 0 |
| Trip beyond 9 fathoms* | 3 | 8 | 0 | — | | |
| Transhipment | 1 | 8 | 0 | 1 | 8 | 0 |
| Trip in strong current or foul weather* | 3 | 8 | 0 | 2 | 8 | 0 |
| Do. do. beyond 9 fathoms* | 5 | 0 | 0 | — | | |
| Ballast trip* | 2 | 12 | 0 | 1 | 10 | 0 |
| Do. beyond 9 fathoms* | 3 | 12 | 0 | — | | |
| Water trip (from the Beach) | 3 | 8 | 0 | 2 | 0 | 0 |
| Do. beyond 9 fathoms | 5 | 8 | 0 | — | | |

* 8 Annas less if proceeding to or from the pier.

Large Pier Boats.

| | Per Ton. | | |
|--|----------|-----|----|
| | Rs. | As. | P. |
| Ordinary trip, at the rate of | 1 | 0 | 0 |
| Trip beyond 9 fathoms, additional | 0 | 8 | 0 |
| Transhipment, additional | 0 | 12 | 0 |
| Trip in strong current or foul weather | 1 | 8 | 0 |
| Trip beyond 9 fathoms | 2 | 4 | 0 |
| Water trip | 1 | 8 | 0 |
| Do. beyond 9 fathoms | 2 | 4 | 0 |

Sundry Charges.

| | Rs. | As. | P. |
|--|-----|-----|----|
| Coolies employed for weighing anchors, each man | 1 | 0 | 0 |
| For tarpaulin, each trip | 0 | 4 | 0 |
| Hire of four casks to contain 500 gallons of water (2 tons) for one trip | 0 | 9 | 5 |
| For filling casks at the water's edge | 0 | 9 | 0 |

Note.—A Government charge of 2 Annas a ton for water is likewise levied.

If supplied from the Pier end.

| | Rs. | As. | P. |
|---|-----|-----|----|
| Boat hire | 2 | 8 | 0 |
| Hire of four casks, at 3 Annas each | 0 | 12 | 0 |
| Water, 2 tons, at 8 Annas per ton | 1 | 0 | 0 |
| | 4 | 4 | 0 |

Jolly Boats.

| | | | |
|-------------------------|---|---|---|
| Ordinary trip | 2 | 0 | 0 |
|-------------------------|---|---|---|

Small Catamarans.

| | | | |
|--|---|---|---|
| Ordinary trip | 0 | 8 | 0 |
| Trip in foul weather or beyond 9 fathoms | 1 | 0 | 0 |
| Catamaran for rafting timber for one day | 1 | 8 | 0 |

Large Catamarans.

| | Rs. | As. | P. |
|---|-----|-----|----|
| Raft, or large catamaran hire, to land boilers or heavy weights | 15 | 0 | 0 |
| Do. do. coolies per trip, for each man | 0 | 8 | 0 |

The above rates to apply to boats working to and from the Beach, between Clive's Battery and Parry & Co.'s office.

| Extra Hire. | Accommodation Boat. | Common Boat. | Catamaran. | Large Catamaran. |
|---|---------------------|--------------|------------|------------------|
| | Rs. As. | Rs. As. | Rs. As. P. | Rs. As. P. |
| Trip between 6 and 8 P.M. | 1 12 | 0 12 | 0 2 6 | — |
| Do. 8 P.M. and 5 A.M. | 3 8 | 1 8 | 0 5 0 | — |
| Do. Parry & Co.'s and Marine Villa | 1 8 | 1 8 | 0 5 0 | — |
| Do. Marine Villa and Adyar | 2 0 | 2 0 | 0 8 0 | — |
| Trip north of Royapooram | 1 8 | 1 8 | 0 5 0 | — |
| For every hour, or portion of an hour, beyond the first, a boat or catamaran is detained alongside, or on shore, night or day | 0 12 | 0 12 | 0 5 0 | — |
| Detention for each hour | — | — | — | 2 0 0 |
| For the coolies for every hour, each man | — | — | — | 0 2 0 |

**To and from Ships of all descriptions lying at anchor within the
Madras Harbour.**

Accommodation Boats.

| | Rs. | As. | P. | | Rs. | As. | P. |
|-----------------------|-----|-----|----|-----------------------|-----|-----|----|
| Ordinary trip | 2 | 8 | 0 | Transshipment | 0 | 12 | 0 |

Common Boats.

| | | | | | | | |
|------------------------|---|---|---|-----------------------------|---|----|---|
| Ordinary trip* | 1 | 8 | 0 | Ballast trip* | 1 | 12 | 0 |
| Transshipment | 1 | 0 | 0 | Water trip (from the Beach) | 2 | 0 | 0 |

Large Pier Boats.

| | | | | | | | |
|-------------------------------|---|----|---|--------------------|---|---|---|
| Ordinary trip, per ton. . . . | 0 | 10 | 0 | Water trip | 1 | 0 | 0 |
| Transshipment do. . . . | 0 | 8 | 0 | | | | |

Water, if supplied from the Pier by Common Boats.

| | | | |
|---------------------|---|---|---|
| Bout-hire | 1 | 8 | 0 |
|---------------------|---|---|---|

Jolly Boats.

| | | | |
|-------------------------|---|---|---|
| Ordinary trip | 1 | 0 | 0 |
|-------------------------|---|---|---|

Small Catamarans.

| | | | |
|-------------------------|---|---|---|
| Ordinary trip | 0 | 5 | 0 |
|-------------------------|---|---|---|

* 8 Annas less if proceeding to or from the pier.

Schedule.

**Vessels chargeable with Light Dues, rate of light dues and
frequency of payment.**

| Vessels Chargeable. | Rate of Light Dues. | How often chargeable. |
|--|------------------------|---|
| CLASS I. | | |
| All Steam Vessels engaged on coasting voyages | 1½ Annas per ton | (a) Once during a voyage for each group, provided that if no port in the Eastern group be touched at, the due for that group shall not be paid. |
| (a) Between Calcutta and Bombay and intermediate ports, except those falling under Class II. | | (b) Once per voyage; one payment to exempt from further payment for 30 days. |
| (b) Between Rangoon and more than one port in the Madras Presidency | | |
| CLASS II. | | |
| All Steam Vessels from Bombay bound for the ports of South Canara whose voyage terminates at Mangalore | 6 Pies per ton | Once per voyage; one payment to exempt from further payment for 30 days. |
| CLASS III. | | |
| All Steam Vessels plying direct between any one port in the Madras Presidency and Rangoon | 14 Pies per ton | Once per voyage; one payment to exempt from further payment for 30 days. |
| CLASS IV. | | |
| All Steam Vessels from Bombay or ports in the Bombay Presidency bound direct for Colombo, and from Colombo direct to ports in the Bombay Presidency | 16 Pies per ton | Once during a voyage. |
| CLASS V. | | |
| All Steam Vessels from Aden bound direct for Colombo, and from Colombo direct for Aden | 1 Pie per ton | Once during a voyage. |
| CLASS VI. | | |
| All Steam Vessels calling at any ports in British India whilst engaged on voyage to or from any port outside India which, in the ordinary course of such voyages, would pass within sight or range of any of the coast lights in the Madras Presidency, and which do not fall within any other class | 12 Pies per ton | Once per voyage per group; one payment to exempt from further payment for 30 days. |
| CLASS VII. | | |
| All Sailing Vessels of 15 tons and upwards, coasting or otherwise, arriving at, or departing from any port in the Madras Presidency | 8 Pies per ton | Once during a voyage for each group; one payment to exempt from further payment for 30 days. |

Madras Cyclone Code.

CHAPTER I.—General arrangements in connection with the Hoisting of Storm Signals at Madras and Coast Ports.

1. The arrangements for the communication to the Presidency Port Officer, to the Deputy Port Conservator, Madras, and to the several Coast Port Officers of information respecting the formation, growth, and course of cyclonic storms, necessary for their guidance in hoisting the storm signals, are carried out by the Meteorological Reporters at Simla and Calcutta under the general direction of the Meteorological Reporter to the Government of India.

2. The Madras ports included in this storm-warning system are as follows :—

A. Ports on the Coromandel Coast.

| | | | |
|--------------|-------------|------------|-----------|
| Gopalpur | Vizagapatam | Madras | Negapatam |
| Calingapatam | Cocanada | Cuddalore | Pamban |
| Bimlipatam | Masulipatam | Porto Novo | Tuticorin |

B.—Ports on the Malabar Coast.

| | | | |
|-------------|-----------|---------|----------|
| Cannanore | Mangalore | Calicut | Kundapur |
| Tellicherry | Cochin | Beypore | |

3. The Meteorological Reporter to the Government of Bengal (Calcutta) supplies the information and works the system for those ports classed as belonging to the Coromandel Coast, and the Assistant Meteorological Reporter for India (Simla) for the Malabar coast ports, as defined above. These officers also afford information respecting the first indications of bad weather in the Bay of Bengal and the Indian Ocean to the Presidency Port Officer, to the Deputy Port Conservator and to the Chief Engineer for Irrigation, Madras.

4. As soon as the existence and probable course of a cyclonic storm in the Bay of Bengal or the Indian Ocean has been ascertained by the Meteorological Reporter of Calcutta or Simla, the Deputy Port Conservator, Madras, Port Officers of the ports likely to be affected by the storm, and the Chief Engineer for Irrigation, Madras, will be informed and warned by the Reporter appointed to give such warnings to his port. The warning signal should usually be hoisted immediately after the receipt of this information. The Meteorological Reporter will continue to keep the Deputy Port Conservator, Madras, and the Port Officers of the warned ports acquainted with the growth, progress, course, and other features of the storm, which will be useful as a guide to these officers in hoisting, when necessary, the danger signal. The danger signal should be hoisted as soon as the Deputy Port Conservator, Madras, or the Port Officer considers it advisable to warn the shipping that a cyclone is approaching either the port itself or the coast in the near vicinity. By these arrangements the Meteorological Reporters will transmit information and warnings direct to the Presidency Port Officer and Deputy Port

Conservator at Madras, and the Port Officers of Gopalpur, Bimlipatam, Vizagapatam, Cocanada, Masulipatam, Negapatam, Tuticorin, Mangalore, Cochin, Calicut, and Tellicherry. At the remaining ports, viz., Calingapatam, Cuddalore, Porto Novo, Cannanore, and Beypore, where the signals will be hoisted by the Port Conservators, the Port Officer under whom they are immediately placed will instruct them by urgent telegram to hoist the warning and danger signals at the same time that they hoist them at their own ports. By this arrangement information respecting bad weather and direction relating to the hoisting of storm signals will be communicated to the—

| | |
|---|----------------------------------|
| Port Conservator of Calingapatam . . . | by the Port Officer of Gopalpur. |
| Port Conservators of Cuddalore and Porto Novo | „ „ Negapatam. |
| Port Conservator of Beypore . . . | „ „ Calicut. |
| „ Cannanore . . . | „ „ Tellicherry. |
| „ Kundapur . . . | „ „ Mangalore. |

5. Copies of all telegrams despatched to the Deputy Port Conservator at Madras and to Port Officers relating to the approach of cyclonic storms, will be sent at the same time to the Presidency Port Officer, Madras, in order that he may be kept fully acquainted with the weather information and instructions communicated by the Meteorological Reporters to the Port Officers subordinate to him.

6. The duties of the Meteorological Reporters at Simla and Calcutta are confined solely to furnishing as definite, full and early information as possible of the character, position, course, probable time of approach, and varying phases of cyclonic storms, to the Port Officers of all ports to which a cyclone will probably cause dangerous weather and a high sea. The responsibility of hoisting and taking down the storm signals rests solely with the Port Officers at coast ports, and at Madras with the Deputy Conservator of the port. These officers will usually be guided mainly by the information received from the Meteorological Reporter, but if that information be insufficient or be delayed in transmission, or if telegraphic communication be suspended by breaks in the lines, they will then be guided by the indications of the barometer, force of the wind, state of the sea, and general aspect of the weather. The Deputy Conservator of the Port of Madras should also place himself in communication with the Meteorological Reporter to the Government of Madras or the Government Astronomer; both these officers should afford him full information.

7. The storm signals to be exhibited at the ports specified in paragraph 2 above (with the exception of Porto Novo, Pamban, Tuticorin, Beypore and Kundapur), are those specified in Appendix A.

(a) At Porto Novo, Pamban, Tuticorin, Beypore and Kundapur, the storm signals to be exhibited are those specified in Appendix B.

8. The Deputy Port Conservator at Madras and all Port Officers noting the appearance of suspicious weather before the receipt of any telegrams from the Meteorological Reporter in connection (or co-operation) with them, should communicate the information without delay to that officer.

9. The Deputy Port Conservator at Madras and all Port officers receiving telegrams from the Meteorological Reporters during a storm, should send a brief statement, after the cyclone has passed away, of the telegrams received from the reporters and of the exact times when they were delivered by the telegraphic officers, etc., in order that the Meteorological Department may exercise an effective check over this part of the working of the system and secure the necessary rapidity of telegraphic communication required for the proper working of the system.

**CHAPTER II.—General arrangements to be made at Madras, on the
“Warning,” “Danger” or “Great Danger” Signals being
displayed at the yard or gaff of the Port flagstaff.**

1. These signals will be repeated at the Port flagstaff.
2. All arrangements in connection with the safety of the shipping will be made by the Deputy Port Conservator upon whom solely the responsibility will rest.
3. Whenever either of these storm signals is hoisted at or lowered from the flagstaff, the fact is to be communicated, as soon as practicable, by the Deputy Conservator of the Port to the undermentioned officials, viz. :—

The Secretary to Government Marine Department when in Madras.

The Private Secretary to His Excellency the Governor, should His Excellency be in Madras.

The Presiding Port Officer.

The Secretary, Harbour Trust Board.

The Commissioner of Police, through the Deputy Commissioner of Police.

The Executive Engineer, St. Thomas Mount.

The Collector of Chingleput.

The Chief Commissariat Officer and Commissariat Storekeeper-General.

The Assistant Adjutant-General, Madras District, Fort St. George.

The President, Madras Municipality.

The Government Telephone Exchange.

The Superintendent of Telegraphs, Madras Division.

4. The Government Telephone Exchange will be kept open day and night whilst the signals are hoisted.

5. The life saving apparatus of the Port and Pier Traffic Department will be kept ready for immediate use.

6. Should the Deputy Port Conservator require any assistance from the following departments, it will be given at once upon that officer applying for same :—

Police Boat Establishment (on application to the Deputy Commissioner of Police).

Harbour Engineer and Pier Traffic Establishments (on application to Chairman, Harbour Trust Board).

7. On the “Danger” signal being hoisted, the Commissioner of Police will place at the disposal of the Deputy Port Conservator two mounted orderlies, and keep fifty men available at the beach for duty.

CHAPTER III.—Wreck Arrangements.

1. Should wreck occur, or the Deputy Conservator deem the same imminent, the following signal will be hoisted :—

By day—two balls vertically ; By night—Two white lights vertically.

2. Should the Deputy Port Conservator consider that there will be danger to life, he will inform the following officers and departments :—

The Port Surgeon.

The Resident Surgeon, General Hospital.

The Ordnance Department.

The Commissariat and Transport Department.

3. Upon receipt of this information the Port Surgeon taking with him a portion of his establishment and medicines and surgical appliances, will immediately proceed to the scene of wreck and render all assistance possible.

4. The Resident Surgeon, General Hospital, will make preparations to receive sick and wounded. The Ordnance Department will comply with any requisitions from the Deputy Port Conservator to provide tents for ship-wrecked people, and men to pitch them.

5. The Commissariat and Transport Department will be prepared to comply with any requisitions from the Deputy Port Conservator to supply trolleys, dandies, blankets, towels, brandy, water and other medical comforts, etc., and send a sufficient number of men to look after the trolleys and to carry the dandies.

6. In the event of a working party being required from the troops in garrison they will be supplied by the Assistant Adjutant General, Madras, upon application from the Deputy Port Conservator.

Police Department.

7. On the Inspector of Marine Police seeing the wreck signal, or being informed by the Deputy Conservator of the Port of the imminent danger of wrecks occurring, he will promptly send intelligence to the Deputy Commissioner of Police, who will immediately increase that Division to such an extent as may be practicable at the time.

8. The entire Police force pending the arrival of the Commissioner will be under the Deputy Commissioner, who will consult the Deputy Conservator of the Port on the spot as to where the services of his men are likely to be emergently required, and will issue whatever detailed orders may be requisite.

9. The Police will be mainly restricted to their own proper duties, *i.e.*, the maintenance of order; protecting personal or other property washed on shore; supervising the conveyance of the shipwrecked crews and passengers to the nearest shelter, and to hospitals if necessary, bringing back the hammocks, doolies and sick carts, guarding or removing the dead, etc. They are not to be employed in hauling ropes or recovering wreckage or cargo, save in emergent circumstances when other labour is not available.

10. The Commissioner of Police will see that duties are so apportioned as to enable the men to be relieved from the reserves as frequently as circumstances may render requisite.

11. All officers and men will be in uniform.

APPENDIX A.

DAY SIGNALS.

1.—Cautionary Signal.

BAY OF BENGAL.

The square flag W of the International Code, hoisted on the Storm Signal Staff as a cautionary signal, indicates the existence of disturbed squally weather in the Bay of Bengal, which may be the first stage in the formation of a cyclonic storm, and which, if it develops, is likely to affect

ARABIAN SEA.

The square flag W of the International Code, hoisted on the Storm Signal Staff as a cautionary signal, indicates the existence of disturbed weather off some part of the West Coast of India in the neighbourhood of the port or ports at which the signal is hoisted, or the advance of a cyclonic

that part of the coast on which the port is situated.

The disturbed conditions may pass away without developing into a cyclonic storm, in which case the cautionary signal will be taken down as soon as it is certain that stormy weather will not shortly follow. If, however, the disturbed weather be the first indication of the probable formation or approach of a cyclonic storm, the cautionary signal will be followed by one of the ordinary storm signals indicating the probable position, character, and track of the approaching storm.

storm across the Peninsula from the Bay of Bengal, which may hence shortly cross the Western Ghats, and give squally or stormy weather in the Arabian Sea.

The disturbed conditions may in either case pass away without giving stormy cyclonic weather to the West coast ports or to the adjacent ports of the Arabian Sea, in which case the cautionary signal will be taken down as soon as it is certain that stormy weather will not shortly follow. If, however, the disturbed weather be the first indication of the probable formation or approach of a cyclonic storm, this cautionary signal will be followed by one of the ordinary storm signals, indicating the probable position, character, and track of the approaching storm.

2.—Warning Signal.

A ball indicates that a cyclonic storm has formed, which will probably advance to that part of the coast on which the port is situated, but is still at a considerable distance from it. The same signal will also be hoisted at the larger and more important ports on the West Coast of India, to indicate that a storm has formed in the Arabian Sea at some distance from the coast, and will shortly cross one or other of the tracks of the vessels leaving these ports, but is not likely to give the ports bad weather. The Port Officers when instructed to hoist the warning signal, will also be informed of the object of the signal so as to communicate its full purport to Masters of vessels about to leave the port.



3.—Danger Signals.

- (1) *A cone, apex downwards*, indicates that a cyclonic storm (probably of slight to moderate intensity) is affecting the port, and that its centre will probably cross the coast considerably to the south of the port.



- (2) *A cone, apex upwards*, indicates that a cyclonic storm (probably of slight to moderate intensity) is affecting the port, and that its centre will probably cross the coast considerably to the north of the port.



- (3) *A drum* indicates that a cyclonic storm (probably of slight to moderate intensity) is affecting the port, and that its centre will probably cross the coast over or near to the port.



In order to indicate that a cyclonic storm in the sea area near a port is of great intensity, a ball is added to (and placed underneath) the corresponding danger signal.



4.—Great Danger Signals.

- (1) *A cone, apex downwards and ball below*, indicates that a cyclonic storm of great intensity is affecting the port, and that its centre will probably cross the coast considerably to the south of the port.



(2) *A cone, apex upwards and ball below*, indicates that a cyclonic storm of great intensity is affecting the port, and that its centre will probably cross the coast considerably to the north of the port.



(3) *A drum with a ball below*, indicates that a cyclonic storm of great intensity is affecting the port, and that its centre will probably cross the coast over or near to the port.

NIGHT SIGNALS.

1.—Cautionary Signal.

— None. —

2.—Warning Signal.



A red light (corresponding to day warning signal), indicates that a cyclonic storm has formed, which will probably advance to that part of the coast on which the port is situated, but is still at a considerable distance from it.

3.—Danger Signals.



(1) *A red light vertically above a white light*, corresponds to day signal No. 1, and indicates that a cyclonic storm (probably of slight to moderate intensity) is affecting the port, and that its centre will probably cross the coast considerably to the south of the port.



(2) *A red light vertically below a white light* corresponds to day signal No. 2, and indicates that a cyclonic storm (probably of slight to moderate intensity) is affecting the port, and that its centre will probably cross the coast considerably to the North of the port.



(3) *Two red lights in a vertical line* correspond to day signal No. 3, and indicate that a cyclonic storm (probably of slight to moderate intensity) is affecting the port, and that its centre will probably cross the coast over or near to the port.



4.—Great Danger Signals.

(1) *Two red lights with a white light below*, arranged in a vertical line, correspond to day great danger signal No. 1, and indicate that a cyclonic storm of great intensity is affecting the port, and that its centre will probably cross the coast considerably to the south of the port.



(2) *Two red lights with a white light above, in a vertical line, correspond to day great danger signal No. 2, and indicate that a cyclonic storm of great intensity is affecting the port, and that its centre will probably cross the coast considerably to the north of the port.*



(3) *Three red lights in a vertical line correspond to day great danger signal No. 3, and indicate that a cyclonic storm of great intensity is affecting the port, and that its centre will probably cross the coast over or near to the port.*

APPENDIX B.

DAY SIGNALS.

1.—Warning Signal.



A ball indicates that a cyclonic storm has formed, which will probably advance to that part of the coast on which the port is situated, but is still at a considerable distance from it.

2.—Danger Signal.



A drum indicates that a cyclonic storm (probably of slight to moderate intensity) is affecting the port, and that its centre will probably cross the coast over or near to the port.

3.—Great Danger Signal.



A drum with a ball below, indicates that a cyclonic storm of great intensity is affecting the port, and that its centre will probably cross the coast over or near to the port.

NIGHT SIGNALS.

1.—Warning Signal.



A red light (corresponding to day warning signal), indicates that a cyclonic storm has formed, which will probably advance to that part of the coast on which the port is situated, but is still at a considerable distance from it.

2.—Danger Signal.



Two red lights in a vertical line correspond to day signal No. 2, and indicate that a cyclonic storm (probably of slight to moderate intensity), is affecting the port, and that its centre will probably cross the coast over or near to the port.



3.—Great Danger Signal,



Three red lights in a vertical line correspond to day great danger signal No. 3, and indicate that a cyclonic storm of great intensity is affecting the port, and that its centre will probably cross the coast over or near to the port.



(Harbour Trust Board appointed Conservator of the Port, etc.)

In exercise of the powers conferred on him by sections 8 and 47 of the Indian Ports Act (XII. of 1875), His Excellency the Governor in Council is pleased to appoint the Madras Harbour Trust Board to be Conservators of the Port of Madras under section 8 for the purposes of the said Act, and to keep the accounts of the Port Fund of the port aforesaid under section 47. And this order shall have effect from and after the 1st July, 1888.

(Port and Marine Surgeon appointed Health Officer.)

Port St. George, January 8, 1884.

Notification.

No. 1.—Under section 18 A of the Indian Ports Act, the Governor in Council has appointed the Port and Marine Surgeon, Madras, to be the Health Officer at that port, to exercise the powers conferred on him by the said section.

Pilotage Fees.

(Section 35, Act X. of 1889.)

In accordance with Government Notification, No. 28, dated 13th May, 1890, vessels entering the artificial harbour shall be liable to the payment of Harbour Masters' fees as per undermentioned scale :—

| | | | | | | | | | Rs. |
|------------------|------|------------------|----------|------|----------|---|---|---|-----|
| On vessels up to | 100 | tons | register | . | . | . | . | . | 4 |
| „ from | 100 | to | 150 | tons | register | . | . | . | 7 |
| „ „ | 150 | „ | 200 | „ | „ | . | . | . | 10 |
| „ „ | 200 | „ | 300 | „ | „ | . | . | . | 11 |
| „ „ | 300 | „ | 400 | „ | „ | . | . | . | 17 |
| „ „ | 400 | „ | 600 | „ | „ | . | . | . | 20 |
| „ „ | 600 | „ | 1000 | „ | „ | . | . | . | 24 |
| „ „ | 1000 | „ | 1500 | „ | „ | . | . | . | 27 |
| „ „ | 1500 | tons and upwards | „ | „ | „ | . | . | . | 34 |

Pending the completion of the said harbour, the rates specified above will include both inward and outward pilotage.

Remission of second Pilotage Fees.

Vessels re-entering the artificial harbour after discharging timber are exempted from pilotage fees.

Overtime fees to Harbour Masters.

(Sanctioned in Notification No. 12, dated 2nd May, 1883.)

On Sundays and close holidays the Harbour Master and Assistant Harbour Master shall be entitled to a fee, by way of personal allowance, of (10) ten Rupees for each vessel moved in or out of the harbour, and a similar fee for each vessel conducted in or out on week-days between the hours of 6 P.M. and 6 A.M.

General Pass Rules.

Notification.

The following are the rules issued by the Board of Revenue, Madras, to carry out the provisions of Chapter XV. of the Sea Customs Act VIII. of 1878, in their application to vessels sailing under a general pass.

The rules include also those approved by the Government of India for the ports of other provinces:—

General.

1. In these rules the word “agent” shall include Masters and owners.

The words “Customs-port” shall include any foreign ports regarding which it has been notified, under section 13 of the Sea Customs Act VIII. of 1878, that all goods imported from or exported to them shall be treated as goods imported from or exported to Customs-ports.

The word “foreign port” shall include all foreign ports, whether on the continent of India or not, except those regarding which a Notification has been issued as above.

The words “dutiable-cargo” or “dutiable-goods” shall be held to mean—

- (a) All goods shipped from foreign ports for Customs-ports whether transhipped at any Customs-port or not;
- (b) All goods specified in schedules 2 and 3 of the Tariff Act XI. of 1882, whether shipped from or to foreign ports or Customs-ports;
- (c) All goods exported under claim for drawback or under bond for duty of customs or excise;
- (d) All goods the importation or exportation of which is prohibited or restricted under section 18 of the Customs’ Act, or any other law for the time being in force.

The words “free cargo” or “free goods” shall be held to mean all goods which do not fall within the above definition or dutiable.

2. A general pass in the form prescribed (Appendix A.) shall be issued for each steamer under the signature of the Collector of Customs (at Calcutta, Madras, or Bombay, as the case may be). It shall be terminable on the 31st of July in each year, and shall be renewable by endorsement on application to the Collector of Customs. It shall be stated on the face of every general pass whether it is valid—

- (a) For certain specified ports only;
- (b) For all ports throughout certain Presidencies; or
- (c) For all Customs-ports throughout India.

The pass shall remain in charge of the Commander or other responsible officer of the vessel for which it is granted. It shall be kept posted up in a conspicuous place on board, and shall be shown to any Customs Officer on demand.

A copy of these rules shall be furnished with each pass for the use of the ship to which it relates.

The agents or owners may choose at their option at which Presidency the pass shall be taken out.

3. By applying for a general pass the agents of a vessel bind themselves, should a pass be granted, to be responsible—

That no goods shall be carried by her in contravention of any law for the time being in force;

That all provisions of the Customs Act and of these and all other rules legally promulgated in accordance with the said Act, by the authorities of this or any other Presidency in which the pass is in force, shall be duly observed;

That all port and light-dues shall be paid, and all duties short levied or refunds or drawbacks erroneously disbursed in consequence of errors or omissions in the cargo-books, manifests, or other documents they are required to keep or put in, shall be made good on demand; and further,

That they shall deposit with the Collector of Customs a sum in cash or Government Promissory Notes, amounting to Rupees 500 for each vessel, but not more than Rupees 3,000 for any company or line, and shall give him a general authority to recover from the said deposit all sums adjudged to be due from them whether as dues, duties, recoveries, fees or penalties, in respect of the vessel for which the pass is granted, or of any other vessel or vessels belonging to the same owners and also sailing under a general pass.

Nothing in this condition, however, shall be held to prejudice their right to appear as provided by section 188 of the Sea Customs Act VIII. of 1878, in any case in which they may consider themselves aggrieved by the Collector's decision.

4. A cargo-book in the form B. annexed should be kept on board every steamer sailing under a general pass. The said cargo-book shall be kept in accordance with the requirements of section 165 of the Sea Customs Act VIII. of 1878, and shall further show separately the dutiable and free cargo received at each port for each port, whether customs or foreign. Cargo received for transhipment shall be shown as for the port at which transhipment is to take place, but the port of ultimate destination shall also be given.

The keeping of the said cargo-book shall not be held to dispense with the presentation of manifests, except in so far as may be provided in these rules.

The agents shall be at liberty to add to the form prescribed any columns they may require to adapt it to their own purposes.

5. Nothing in these rules shall be held to exempt the agents or Masters of vessels sailing under a general pass from payment of any fees for special services or from any restrictions as to lading or discharge of dangerous goods imposed upon them by which the rules of any port at which the pass is valid.

Lading and Clearance.

6. Vessels sailing under a general pass may be entered outwards, and shipping bills granted in anticipation of arrival.

7. No goods, except transhipment goods and passengers' baggage, shall be received on board without a shipping bill. All shipping bills shall be in English; and at ports where there are no other facilities for their preparation in that language, the agents of the vessel shall be bound to provide for this requirement; shipping bills shall be in the annexed form C. For free goods they shall be prepared in duplicate, printed in black and blue. For dutiable goods they shall be in triplicate, printed in black, blue and red, with the word DUTIABLE printed across in large type in red ink.

8. Free cargo may be shipped at any time, day or night, except on Sundays or holidays, without special permission or supervision: Provided that no goods shall be shipped at night without supervision, except such as have been water-borne for shipment during ordinary working hours.

At the port of Madras, however, goods can be shipped only from 6 A.M. to 6 P.M., or from sunrise to sunset, but not afterwards, unless the cargo boats have left the pier by 6 P.M., in which case all cargo may be shipped on board the same evening subject to the right of the Port Officer to regulate the boat traffic on considerations of weather. The Collector of Sea Customs, Madras, may extend the time for the shipping of goods on good cause for granting the extension being shown. Goods to be exported on contract mail vessels may be shipped at the pier up to 9 P.M. on Sundays and holidays, as well as on ordinary week days.

9. Dutiable goods shall not be shipped, except under Customs supervision. The original shipping bill shall be filed at the Custom-House, and the duplicate shall accompany the goods on board. The triplicate shall be retained by the officer supervising the shipment either at the wharf or on board, who after endorsing upon it the particulars of the goods actually received on board, shall return it to the Custom-House for use in checking the vessels export general manifest, as provided below, rule 13.

10. The agents shall cause similar endorsements to be made upon the duplicate shipping bills both for free and for dutiable goods. Those for dutiable goods shall accompany the vessel; those for free goods shall be retained by the agents for presentation with the export manifest.

11. Port clearance must be applied for during office hours, unless otherwise directed by the chief Customs Officer, and at least four hours before the departure of the vessel and must be sent on board before she actually leaves the port.

12. The export manifest shall be in the same form as is prescribed for the cargo-book by rule 4. It must be put in by the agents within five clear working days from the date of port clearance, and must be accompanied by a duplicate prepared in separate parts—one for each port for which goods have been shipped, and by the duplicate shipping bills for free goods endorsed with particulars of actual shipment as required by rule 10.

13. After the original and duplicate have been compared and checked with the triplicate shipping bills for dutiable goods, and the duplicate shipping bills for free goods, one copy of the different parts of the manifest shall be sent by post, together with the corresponding duplicate or triplicate shipping bills, as the case may be, to the Customs Collector at the ports to which they respectively relate, and the original export manifests shall be retained for use in conjunction with the original shipping bills in recording reports statistics.

Entry and Discharge.

14. Within 24 hours after arrival in any Customs-port, terminal or intermediate, a duly authenticated extract from the cargo-book kept on board, as required by rule 4, showing all cargo, free or dutiable, to be discharged, whether for landing or transshipment at that port, shall be presented at the Custom-House, together with the duplicate shipping bills referred to in rule 9 for all dutiable cargo comprised in the extract which may have been shipped at Customs-ports.

Note.—The form of the extract may be modified by the substitution of columns for record of presentation of bill of entry and final clearance of dutiable goods, for column 7 and onward in the form of cargo-book.

15. At ports where the cargo is to be discharged direct on to a wharf, a duplicate of the extract from the cargo-book shall be furnished for use in checking the cargo as it is landed. When the cargo has to be discharged into boats, the duplicate copy may be dispensed with, but a boat-note showing clearly all particulars necessary to the identification of the packages, and signed by a responsible officer of the ship, shall accompany each boat-load ashore :

Provided that at ports of call where the extract from the cargo-book to be put in under rule 14, or a list of the cargo is handed to the Customs Officer on board, or accompanies the goods ashore, no boat-notes or duplicate extract from the cargo-book need be insisted upon.

16. At ports in the Lower Provinces of Bengal and at ports in the Madras Presidency (the chief port of Madras excepted), discharge may be commenced, as soon as the vessel drops anchor, when free cargo may be landed at any time, day or night, without special permission or supervision, but no cargo from any foreign port and no cargo from any Customs-port which was transhipped from a foreign port shall be discharged, except under the written authority of the proper Officer of Customs.

17. At ports in the Bombay Presidency discharge may be commenced as soon as the vessel drops anchor, and cargo, whether dutiable or free, may be landed at any time, day or night, except on Sundays and holidays, without special permission or supervision, except in respect of work at wharves where supervision may be necessary out of hours ; provided that the agents shall be responsible that dutiable cargo shall be covered by separate boat-notes or lists, if the cargo is discharged by boat and stacked separately on the wharf, and that it shall only be delivered on production of bills of entry duly passed by the Customs Department, and on payment of any duty that may be due upon them.

18. These bills of entry shall be in the usual form for goods imported by foreign-going vessels, and shall be granted upon the extract from the cargo-book filed at the Custom House, as required by Rule 14, after check, if the goods are said to have come from a Customs-port, with the shipping bills filed with the extract.

19. At the port of Madras, subject to the right of the Port Officer to regulate the boat traffic on considerations of weather, goods may be landed on the beach or at the pier at any hour between 6 A.M. and 6 P.M., or sunrise and sunset, but not afterwards, unless the cargo-boats have left the ship's side by 6 o'clock P.M., in which case they shall be entitled to discharge at the pier the same evening. Goods imported by contract mail vessels, however, may be discharged at the pier up to 9 P.M. on Sundays and holidays, as well as on ordinary week-days. The Collector of Sea Customs may, at his discretion, extend the time for the landing of goods on good cause for granting the extension being shown. The regulated fees must be paid to the subordinates of the Customs and Marine Departments, in accordance with the prescribed rules in consideration of the extra labour

entailed, whenever they are called upon to work overtime, or on Sundays and holidays under the orders of the officer in charge of the Custom-House.

20. Except at ports in the Lower Provinces of Bengal, free cargo may be removed by the owners as soon as it has been checked off on the extract from the cargo-book furnished for the purpose, or cargo-list, or boat-notes, as contemplated in Rule 15. When the cargo has not been checked off on the original extract from the cargo-book, the cargo-list, duplicate extract or boat-notes used for the purpose, as the case may be, shall be retained for subsequent comparison with the original extract from the cargo-book.

21. The agents of the vessel shall be bound to account, on being called upon to do so, for all discrepancies both as to free and as to dutiable cargo, and to make all amendments necessary to secure the correctness of the documents put in by them.

22. The agents shall further be bound to undertake that when the vessel touches at any foreign port in the course of any coasting voyage, a certificate under the signature of the Chief Officer of Customs at such port, shall be despatched within 48 hours of her departure, to the Customs Collector of every Customs-port for which she has taken in cargo at such foreign port, giving number and description of packages, numbers and marks they bear, and a general description of their contents.

They shall also be bound to furnish to the chief Customs Officer of any Customs-port from which any goods may have been shipped under bond for Customs or Excise duty, or under claim for drawback, for any foreign port, a certificate from the chief Customs Officer of the said foreign port showing particulars of discharge of such goods.

Transhipment.

23. All transhipment cargo to be discharged or received by a vessel sailing under a general pass shall be distinctly entered in the cargo-book of such vessel, and in the extract from the cargo-book, or the export general manifests to be put in under Rules 14 or 12 respectively, as the case may be.

24. The particulars of all cargo discharged for transhipment shall be entered by the Customs Officer on board the discharging vessel, or if there be no Customs Officer, then by a responsible officer of the ship in a boat-note or boat-notes with counterfoils, and no such cargo shall be received on board without a boat-note, which shall be endorsed by the receiving officer in the same manner as a shipping bill.

Separate boat-notes shall be given for free and dutiable goods, respectively, those for the latter being rendered readily distinguishable by having the word DUTIABLE printed across the face in large type in red ink.

25. The counterfoils shall be sent to the Custom-House before the vessel sails, and shall be afterwards checked with the inwards extract from the cargo-book, put in by the discharging ship under rule 14, and if the goods are from a Custom-port or Indian foreign port, with the export manifest and shipping bills, or the certificate of shipment, received from such port as provided by rules 12 and 23.

26. The boat-notes shall also be sent ashore and shall be presented by the agents of the receiving ship in support of the export general manifest to be put in by them after the vessel's departure, as provided by rule 12. If the goods covered by them are for a Customs-port, they shall, after the export general manifest has been checked, be forwarded as accompaniments with the duplicate manifests to the port of destination. If the goods have been shipped at a Customs-port, the shipping bills relating to them, received from the port of shipment, shall be sent on, with the boat-notes and the duplicate of the export manifest, to the port of destination.

27. Free goods may be transhipped as above without supervision. Dutiable goods shall not be transhipped unless otherwise directed by special order in writing, except in the presence of an Officer of Customs who shall fill in the boat-notes and counterfoils required by rule 25.

28. If any cargo on which duty has to be recovered at the port of discharge shall have been transhipped for any Customs-port, the Master of the receiving vessel shall, before he sails, present to the Customs Officer on board a list in duplicate of all such cargo received by him for each such port. The Customs Officer after verifying the lists shall retain one copy and return the other to the Master for presentation on arrival to the Customs authorities at the port of destination.

In the case of dutiable transshipment goods from a Customs-port, the duplicate shipping bills brought on by the discharging vessels shall be transferred to the Master of the receiving vessel with the copy of the transshipment lists of goods on which duty is to be recovered for presentation at the Customs-port of discharge.

29. Transshipments of dutiable goods from foreign-going vessels shall be subject to general rules as to liability to fees and necessity for tranship-permits before transshipment is allowed.

30. The foregoing rules 23 to 29 are not applicable to ports in the Lower Provinces of Bengal. At those ports goods for transshipment shall be dealt with as provided in the rules laid down by notification of the Government of Bengal, dated the 26th November, 1883, and the notice of the Collector of Customs, Calcutta, dated the 27th June, 1882.

Stores.

31. No stores shall be landed, transhipped, unladen, shipped or water-borne for shipment without the written authority of the proper Officer of Customs.

Passengers' Baggage.

32. Passengers' baggage may be shipped and discharged at any time without supervision or restriction, except as regards baggage shipped at foreign ports. It will be the duty of the Master to enter all such baggage in his cargo-book, and extracts therefrom to be presented under rule 14, and to see that no such baggage is landed out of hours at any Customs port unless it has been passed by a Customs Officer on board.

Bye-laws made by the Harbour Trust Board.

The following bye-laws made by the Harbour Trust Board, Madras, under section 70 of Madras Act II. of 1886, and approved by the Governor in Council, are published for general information :—

1. Landing and shipping of cargo shall be carried on on the days and within the hours allowed and appointed under section 72, Act II. of 1878, or on other days and at other hours with the permission of the Collector of Sea Customs.

2. Harbour dues on goods shipped or landed, together with all coolie hire and charges for carrying, packing and storing, and all godown or ground rent payable under these bye-laws, shall be charged at the rates fixed by the Board under the provisions of Act II. of 1886; and such dues on all goods, whether exports or imports, shall be paid previous to the removal of the goods from the harbour premises to such person as the Board may depute to receive and grant receipts for the same. All applications for export or import of goods must be on, or must be accompanied by, forms approved by the Board,

and in use for the time being, and such forms must, in all cases, be correctly filled in and signed by the owner, exporter or consignee of the goods, or his agents.

3. All goods landed at the port of Madras shall be moved from the place or places where the same may be landed to the place or places set apart for the reception thereof by some person or persons authorized in that behalf by the Board, who shall in due course deliver the same to the consignees upon payment by the consignees of all costs and charges of receiving and of so moving such goods and of delivering the same, including all costs, charges and expenses of counting, sorting and weighing, and other costs, charges and expenses whatsoever incurred or payable under the directions, and with the sanction of the Board.

4. All coolies or porters employed under the Trust for the purpose of working cargo on the pier or beach, or in the Custom-House or elsewhere wheresoever within the precincts of the harbour premises, shall wear a distinctive badge, and no such person shall be allowed to work as a coolie or porter within such precincts without such badge.

5. All necessary documents must be produced by shippers or consignees or their agents at the time of the shipping or landing of goods to the person or persons authorized by the Board to call for and inspect the same whenever required by him.

6. Three days' grace from date of landing will be allowed for the removal of all cargo free of godown or ground rent; after that, godown or ground rent, as the case may be, will be charged at the rates fixed by the Board under the provisions of Act II. of 1886.

7. Coal and patent fuel shall be landed only at such place or places as may be approved by the Board for that purpose from time to time. Importers desiring to store the same within the limits of the Harbour Trust premises must apply to the Secretary of the Board for such space as may be required for that purpose, and such applications will be granted by the Board at their discretion, when ground is available for that purpose, on such terms as the Board shall see fit, and rent will be payable for the plot so assigned at the rate fixed by the Board under the provisions of Act II. of 1886.

8. Timber or firewood shall not be discharged from any vessel lying inside the harbour, except into boats or lighters, without the special sanction of the Deputy Port Conservator previously obtained, under a penalty, upon conviction before a Magistrate, not exceeding Rupees 50 for each offence.

9. Timber of all descriptions and firewood shall be landed only at such places as may from time to time be assigned, or set apart by the Board for that purpose, under a penalty, upon conviction before a Magistrate, not exceeding Rupees 50 for each offence.

10. Whoever deposits goods within the harbour premises, except at such place or places as may be set apart for the purpose by the Harbour Trust Board, should be liable, on conviction before a Magistrate, to a fine of Rupees 20.

11. Excepting ships' boats, no boat, lighter, raft, catamaran, or other vessel whatsoever for the conveyance by water of human beings or property, will be allowed to approach or lie alongside of the beach, or any wharf, pier or dock within the limits of the harbour premises, without a license from the Harbour Trust Board in that behalf, under a penalty upon conviction before a Magistrate, not exceeding Rupees 20 for each offence; applications for such licences shall be made to the Secretary of the Board.

12. Smoking, or the use of fire or naked lights on the pier or any jetties, or in or near any godown or enclosure or open space used for the time being for the storage of goods within the precincts of the harbour premises, is strictly prohibited; and any employé of the Harbour Trust Board is empowered to stop any person so smoking, or put out such fire or naked lights, and all persons so smoking or lighting or using such fire or naked lights shall be liable to a fine not exceeding Rupees 100 for each offence.

13. The pier ladder will be available for the use of passengers and others, weather permitting, from 5 A.M. to 9 P.M.

14. All boats and other craft must lie clear of the pier ladders, under a penalty, upon conviction before a Magistrate, not exceeding Rupees 20 for each offence.

15. No boats, lighters or raft will be permitted to lie alongside of, or make fast to, the pier except when loading or unloading or for the purpose of taking off or landing passengers or baggage under a penalty, upon conviction before a Magistrate, not exceeding Rupees 20 for each offence.

16. Crews must remain in their respective boats and lighters when alongside the pier, and must obey the orders and directions of the Traffic Manager or his Deputy, under a penalty, upon conviction before a Magistrate, not exceeding Rupees 20 for each offence.

17. Mooring buoys will be provided and maintained off the pier, and all boats, lighters and other craft must make fast thereto when ordered to do so by the Traffic Manager or his Deputy, and not approach the pier or pier ladders until permitted to do so under a penalty not exceeding Rupees 20 for each offence.

18. Lighters, boats and rafts must be securely moored at a distance of not less than one hundred yards from the pier when afloat and unemployed, and will not be permitted to make use of the Harbour Trust mooring buoys around the pier, except with the permission and under the direction of the Traffic Manager or his Deputies under a penalty upon conviction before a Magistrate not exceeding Rupees 20 for each offence.

19. No lighters, boats or other craft shall be brought ashore or beached for the purpose of repair, except at such place or places as may be assigned and pointed out by the Traffic Manager or his Deputies for that purpose, under a penalty upon conviction before a Magistrate not exceeding Rupees 20 for each offence.

20. The public will be admitted to the pier when no traffic or work is going on. At all other times the Board reserve to themselves the right of excluding the public, and only those persons will be allowed upon the pier who have business to transact on the pier, or require to pass over it for purposes of embarking or landing.

21. No puckage containing gunpowder, or other explosive, shall be landed within the limits of the Port of Madras without permission first obtained from the Collector of Sea Customs and from the Chairman, Harbour Trust Board, or in his absence, from the Secretary of the Board; and no gunpowder, or other explosive, shall be landed within five hours of such application being so made to the said Chairman or Secretary, if made between the hours of 6 A.M. and 11 A.M. or within two hours of such application being made, if made between the hours of 11 A.M. and 4 P.M., or within fifteen hours of such application being made, if made after 4 P.M., except and unless the said Chairman or Secretary shall have first expressly sanctioned the earlier landing thereof, and in the landing thereof all rules or directions from time to time made or given by the Board or by the said Chairman or Secretary, to ensure safety, shall be rigidly adhered to and observed, under a penalty upon conviction before a Magistrate not exceeding Rupees 100 for each offence.

22. All prosecutions under the provisions of these Byc-laws shall be instituted by, or by order of, the Chairman, Harbour Trust Board.

Prosecutions require sanction of the Chairman.

Special Notice to Commanders of Vessels visiting the Port of Madras.

Code for telegraphing weather conditions in the Bay of Bengal daily to outward-bound vessels passing Saugor Island Lighthouse, and to vessels at certain ports on the coast of the Bay of Bengal, such as Rangoon, Negapatam, Cocanada, and Madras.

(Revised October, 1894.)

The following signals are intended to be used in ordinary weather and also, if possible, during stormy weather, and will therefore be supplementary to the ordinary storm-signals which are hoisted only when storms have actually formed.

The ordinary Commercial Code signal flags (B. to W. inclusive) will be used in making these signals. Each signal flag will have a special signification as to the weather in the Bay, as indicated in the table on page 5. The weather in the Bay daily will be expressed by a single hoist of flags. Each signal, or hoist of flags, will consist ordinarily of four flags. The top flag will be considered to occupy position 1, that below it will be flag No. 2, and so on, the bottom flag being No. 4. These flags will be hoisted usually on the signal mast employed for hoisting the ordinary storm-signals, and by the same halyards, so as to distinguish these messages from ordinary commercial messages. By the experience of more than two years it has also been found possible to arrange the flag signals for each day, so that there are almost always at least two flags of the same letter (two B's or two G's etc.). Hence this forms at once a distinguishing mark of these weather messages from ordinary or commercial messages.

It is not possible for the information regarding the weather in the Bay for each day at 8 A.M. to be collected, and for the flag signal telegrams to be prepared and despatched from Calcutta, and for them to be received at the signalling stations much before 11 A.M. daily. Hence for the period between daylight and about 11 A.M. on each day, the flag signal message will usually deal with the weather at 8 A.M. on the previous day. To indicate that this is the case, and that the signal hoisted on any day from daylight up to about 11 A.M. denotes the weather of the previous day, the "Answering Pennant" will be hoisted at the bottom of the four Code flags of the signal.

For the purposes of these signals the Bay of Bengal has been divided into four sections, as shown in the chart, page 4. The top flag in each daily signal (*i.e.* flag No. 1) will denote the weather in section No. 1 of the Bay as in the chart, flag No. 2 will denote the weather in section No. 2, flag No. 3 the weather in section No. 3, and flag No. 4 or the bottom flag of the signal, will denote the weather in the 4th section of the Bay, *i.e.*, that off the South Madras Coast.

On receipt of the daily 8 A.M. meteorological telegrams by the Meteorological Office, and after their reduction, or at about 10.30 A.M. a daily Code message by urgent telegram will be despatched by the Bengal Meteorological Office to Saugor Island and the other stations included in the service. Signals can, therefore, be hoisted at Saugor Island, etc. daily at about 11 A.M., showing the weather of the same day over the whole Bay to all vessels that leave the port after that hour.

Thus, supposing a weather signal of four flags hoisted at any of the stations included in this service on any day at 11 A.M. read "B. B. B. B." it will mean that

"ordinary weather for the season, light or moderate winds of direction about normal for the season, and calm or slight sea," prevailed in all four sections of the Bay at 8 A.M. of that same day. Also if the flag message at 10 A.M. of any day consisted of five flags and read "B. B. B. B. Answering Pennant," it would mean that "ordinary weather for the season, with light or moderate winds, etc.," prevailed over the whole Bay at 8 A.M. on the previous day.

Again, if a weather flag-signal telegram read "B. P. S. V.," this will mean that 8 A.M. of the day in question weather in section 1 of the Bay (*i.e.* off Burmah and Arakan coasts to Longitude 90° E.) was "ordinary weather for the season, light or moderate winds, of direction about normal for the season, and calm or slight sea." Also that—

Weather in section 2 of Bay (*i.e.* at the head of the Bay, north of Latitude 19° 30' N.) was "unsettled, suspicious, and probably squally weather, strong winds of rather abnormal direction and probably moderate to rough sea." Also that—

Weather in section 3 of Bay (*i.e.* off Ganjam, Circars, and North Coromandel coasts to Longitude 90° E.) was "unsettled, suspicious, and probably squally weather, strong winds which apparently form part of a whirl or cyclonic circulation of winds, and probably moderate to rough sea." Also that—

Weather in section 4 of Bay (*i.e.* the southern part of the Bay off the south Madras coast, south of Latitude 13° 30' N.) was—"Conditions indicate that a small storm at present of slight intensity has formed, or is forming, in the section of the Bay referred to. Strong winds. Probably moderate to rough sea."

If the flag message read "B. P. S. V. Answering Pennant," the description in the weather given in the four previous paragraphs would refer to the previous day, and not to the day on which the signal was hoisted.

In the first issue of this Code no arrangement was made by which the weather conditions in the Bay at any other hour than for 8 A.M. could be communicated. It is clear, however, that in certain exceptional cases it is desirable to have the power of conveying additional information for later periods than 8 A.M. Thus as at first arranged, if a vessel were proceeding to sea in the early morning, and at, say 6 A.M. of any day passed Saugor Island, she could only receive information of the character of the weather at 8 A.M. of the previous day or for a period of 22 hours previous. In the very great majority of cases no difference in the weather in this period would have occurred, and hence no alteration of the signal would be required, and the vessel would receive all the information which could be given, or which was actually necessary.

It might, however, happen, and indeed sometimes does happen, that the weather is considered by the Meteorological Office to be only suspicious and unsettled at 8 A.M. when by the evening, as judged by additional meteorological observations received, the Meteorological Office would be able to say almost certainly that a storm had formed in the Bay and had perhaps commenced to move. Indeed storms frequently form and become rather violent within a period of six or twelve hours during unsettled, suspicious weather, specially in the north of the Bay and in the Andaman Sea. It is hence highly desirable in such a case, as previously mentioned, of a ship leaving, say at 6 A.M., that a signal could be made to her indicating the condition of the weather up to the very latest hour for which observations had been received.

With the view of supplying such information the following additions have been made to the Code, for it is found a very slight modification of the method of exhibiting the flag signals will enable such additional information to be given:—

The ordinary four-flag-signal message will always indicate the weather conditions in the Bay at 8 A.M. of the day in question.

All additional information for hours other than 8 A.M. will be shown by hoists of five flags or rather four Code flags with the addition of the "Pilot Jack" (*i.e.* the Union Jack with the border of white one-fifth the breadth of the Jack).

The time to which the message refers will be indicated by the position of the Pilot Jack in the four-flag-signal message in the following manner :—

If the special weather-flag-signal message refers to the weather at mid-day (instead of 8 A.M.), the Pilot Jack will occupy the first position in the signal and the four flags of the signal will follow in their due order.

If the special flag signal message refers to the weather at 4 P.M. (instead of 8 A.M.), the Pilot Jack will be in the second position (*i.e.* it will be placed between the first and second flags of the four flags of the signal).

If the message refers to the weather at 8 P.M., the Pilot Jack will be in the third place (*i.e.* it will be between the second and third of the four flags of the signal).

If the message refers to the weather at midnight, the Pilot Jack will be in the fourth place (*i.e.*, it will be between the third and fourth flags of the signal).

Finally if the message refers to the weather at 4 A.M. instead of 8 A.M. of the previous day, the Pilot Jack will occupy the last position of the signal after the usual four flags.

Thus, taking the second illustration previously given of the use of these signals when B. P. S. V. was hoisted. If the flags B. P. S. V. were hoisted alone, it would signify that the condition described on page 2 probably obtained at 8 A.M. of the day for which the signal was hoisted.

If the message referred to the weather at noon, the flag signal would be Pilot Jack B. P. S. V.

If the message referred to the weather at 4 P.M. previous to the hoisting of the signal, it would read B. Pilot Jack P. S. V.

If the message referred to the weather at 8 P.M. previous to the hoisting of the signal, it would read B. P. Pilot Jack S. V. and so on.

It is believed that the addition here described will prove to be valuable in cases when storms are in process of generation. It will, however, be understood that these additional signals will only rarely be used, and only in such cases when from additional information received in the Meteorological Office it is found that there had been such a decided change in the conditions of the weather as to necessitate the alteration of the usual signal message which had been issued after the receipt of the daily 8 A.M. observations.

Covelong, in Latitude $12^{\circ} 46' 30''$ N., Longitude $80^{\circ} 17' 40''$ E., is a small customs port, but there is now little or no trade.

The Sanskrit name is Nityakalyanapura, meaning "daily marriage city."

The Nawab of Arcot built a fort here, and called the port "Saudat Bandar," or "Auspicious Port."

It was one of the earliest European settlements, and was formerly of strategical importance.

The Muhammedans state that the dead body of a very holy person was washed up by the sea close to the port. The body was enclosed in a coffin with directions on it that the body was



MAHABALIPURAM or SEVEN PAGODAS OLD LIGHTHOUSE

to be given a tomb. The Nawab complied with these instructions and a handsome mosque was built over the tomb.

Covelong was a Dutch settlement in the 17th century, but their fort has disappeared, the ruins now in existence belonging to the fort built by the Nawab.

The best anchorage is with Covelong House bearing $N. 84^{\circ} W.$ magnetic, in 4 to 5 fathoms, sand and mud, and good holding ground.

Seven Pagodas, or Mahabalipur Light, in Latitude $12^{\circ} 36' 55'' N.$, Longitude $80^{\circ} 11' 31'' E.$, is situated on a rock half a mile inland and marked on the charts Pagoda Rock.

It is very conspicuous, and lies about 6 miles North of Sadras.

It is a triple flashing white light of the 2nd order, giving 3 flashes every 10 seconds. The light is visible 18 miles in clear weather. The arc of illumination is from $N. 34^{\circ} E.$ through $N.$ and $W.$, to $S. 22^{\circ} W.$

Tripalore Reef, having rocks awash at low water, extends a mile from the shore abreast of the Lighthouse and Sadras Hills, and should be given a wide berth.

Rockingham Patches, with a least depth of 11 feet, lie $1\frac{1}{4}$ miles from the beach, and $4\frac{1}{2}$ miles $N.E.$ of Tripalore Reef. These dangers lie out as far as the 6 fathom line.

From the outer edge of the patches, where the depth is $3\frac{1}{2}$ fathoms, Covelong Point bears $N. \frac{5}{8} E.$ and the Seven Pagodas Lighthouse $S.W.$ by $S.$

The town of Mahabalipur is one of the most interesting in Southern India, and important to archæologists.

The dispute as to its name has been freely discussed in the Honourable Mr. Crole's Manual of the district, and it is a moot point whether to the Malla family, of the Chalukyas, or to Bahi, of legendary greatness, belongs the honour of naming these wonderful temples.

Between this and Pondicherry the 5 fathom line is about a mile from the shore.

Sadras. The Dutch established a factory here in 1647, and remained for over a hundred years.

It was captured by the English in 1756, but restored to the Dutch in 1818. It has, however, been an English possession since 1824 under treaty, one stipulation being that the old Dutch cemetery was to be maintained in good order.

This promise has been faithfully kept, and some of the tombs are very interesting, dating back to 1679.

The ruins of the large brick fort, as well as the remains of the Dutch buildings and gardens, are in sufficiently good preservation to give evidence of the prosperity of the place in former days. One of the buildings is still used as the travellers' bungalow.

The town was once famous for a very beautiful muslin which was much prized; there are even yet a few looms, but the skill has unfortunately been allowed to die out.

The town is situated at the mouth of the Palaur river, but the bar has silted up, and as a port it is now of no importance.

The best anchorage is abreast the town in 4 to 5 fathoms, with Finger Peak, bearing N.W. $\frac{1}{4}$ W. The Peak has a temple on its summit and is 483 feet high.

Pondicherry, or Punducheri, is the capital of the French possessions in India, and residence of the Governor.

The town is divided into two parts, and separated by a canal, and presents a picturesque and imposing appearance from seaward.

The cathedral, having two square towers with a cupola on the west side, is the most conspicuous object from seaward.

Pondicherry was purchased by Francois Martin, Agent of the French East India Company, in 1683, from the Raja of Vijayapur. It was then a mere village, but fortifications were built and very soon the trade began to spring up. It was, however, wrested from M. Martin by the Dutch in 1693, who held it until 1697, when it was restored to the French under the treaty of Ryswick.

During the seven years' war, as the French Government would do nothing to assist their Indian possessions, the English overran them, and in 1761 the town surrendered to the English.

Two years later England restored this and the other factories she had taken, to the French, but in 1778 they again fell into the hands of the British.

In 1783, by the treaty of Versailles, all the French possessions were again restored; but the English, as usual, took advantage of war breaking out in Europe to seize all the French possessions in India in 1793. They were again restored, however, in 1802, only to be once more taken by the English a year later.

During Napoleon's long wars in Europe, the French power practically ceased to exist in India. Pondicherry was, however,



PONDICHERRY.

restored to the French in 1815, and they took possession in September of the following year, from which time the modern city dates.

The best anchorage is with the Lighthouse, bearing from *N. 45° W. to N. 70° W.*, according to the wind and current.

It is high water, full and change of the moon, at 8 hours 25 minutes, the spring tides rise $3\frac{1}{2}$ feet, neaps $2\frac{1}{4}$ feet.

The principal exports are ground nuts, ground nut oil and seeds, valued at 14,000,000 Rupees.

The imports are principally European goods and liquors, and ordinary bazaar cargo, valued at 9,000,000 Rupees.

The Light, in Latitude $11^{\circ} 55' 25''$ *N.*, Longitude $79^{\circ} 49' 35''$ *E.*, is situated in a square near the beach.

It is a fixed, white, dioptric light of the 4th order, illuminating an arc of 360° , standing 89 feet above the level of high water, and visible from all directions seaward for a distance of 14 miles.

The Lighthouse column is built of stone, and is painted light yellow.

From a mast at the extremity of the landing stage a fixed red light is shown, 31 feet above high water level, and visible 4 miles.

When the surf is heavy and approach to landing place prohibited, a fixed green light is shown, 26 feet above high water level, visible about 4 miles.

Vessels may communicate with either Flagstaff.

There is a very good screw pile pier, from which all the cargo is landed and shipped in the fine season.

The Port and Quarantine Rules are somewhat strict for steamers direct to or from Europe, but coasting steamers experience no difficulty whatever.

Stores and provisions can be obtained, and are very good and cheap.

European seamen are admitted into the colonial hospital.

There is a resident British Consul.

It is a regular port of call for the British India Company's steamers, and many large steamers load here direct for Europe.

The French mail steamer to and from Calcutta and Colombo calls here, and the town is connected with other parts of India by railway.

Cyclones may be experienced from October to the end of December.

Cuddalore is situated on the backwater formed by the confluent estuaries of the Guddilam and Párávanár. It is the principal port in South Arcot, and is in railway communication with Madras.

The ruins of Fort St. David can be seen about 2 miles to the northward of the town, only a few ruins now remain, but it must have been a place of considerable strength, and was the scene of many a bloody battle. During the siege when Tippu held the fort a drawn battle was fought in this roadstead between the French and English, in 1782.

The best anchorage is in 4 to 5 fathoms, sand and mud, with the Flagstaff bearing from N. 32° W. to N. 59° W. magnetic according to the wind and current, and to expedite the boats.

With Flagstaff bearing W. $\frac{1}{2}$ N. soundings are as follows:—

| | | | |
|--------------------|-----|----------|-----------------|
| 18 feet | ... | 8 cables | from Flagstaff. |
| 23 " | ... | 9 " | " " |
| 27 " | ... | 1 mile | " " |
| 28 $\frac{1}{2}$ " | ... | 1.1 " | " " |

and with the Flagstaff on a more northerly bearing there is better water nearer in shore, all sand and mud.

An iron buoy, painted red, has been moored in the roadstead in $5\frac{1}{4}$ fathoms lowest spring tides, with the Flagstaff bearing N.W. by W. $\frac{1}{4}$ W. magnetic. This buoy is connected with the shore by a warp.

The Light, in Latitude $11^{\circ} 43' N.$, Longitude $79^{\circ} 46' 15'' E.$, is a fixed, red, dioptric light, of the 6th order, illuminating an arc of 180° from north through west to south, standing 130 feet above high water level, visible in clear weather 6 to 8 miles.

The light is exhibited from the cross trees of the Flagstaff, which is painted white.

Native craft of 200 tons can get up the backwater at high tide, and the boats discharge their cargo at the jetties opposite the Custom House.

There is considerable trade at this port and many large steamers load here with ground nut and oil for the French ports.

It is also a regular port of call for the British India Company's coasting steamers.

The principal exports are ground nuts and oil, poonac, palmyra jaggery, sugar, raw spirit, and rice and paddy, valued at 5,200,000 Rupees.

The imports are principally coal, timber, spices, and European stores and provisions, valued at 700,000 Rupees.

Parry & Co. have distilleries and extensive sugar works.

There are 145 boats belonging to the port with a total capacity of 1560 tons, and there are about 400 boatmen always available.

Labour is abundant, and there is a fixed rate of payment at 6 Annas per man for a day of 10 hours.

The cost of working cargo is 3 Annas a ton, and landing and shipping costs from 12 to 15 Annas a ton.

The port is under the charge of a Conservator, who is in charge of the dredging operations.

Fresh water can be supplied at the rate of 1 Rupee per 1000 gallons.

Fresh provisions can be obtained in any quantity and are cheap and good. No stores or coal.

There is a hospital and civil dispensary at New Town, 3 miles from the port, where European seamen can be treated.

Porto Novo, in Latitude $11^{\circ} 29' 25''$ N., Longitude $79^{\circ} 48' 13''$ E., is situated at the mouth of the Vellar river. The port has still a considerable trade, and is largely frequented by native craft. It is also a port of call for the British India Company's Steamers to Singapore.

A company called the Porto Novo Iron Company established a large factory, but after many years of patient endeavour it had to be abandoned, and the factory is now in ruins; the canals they constructed silted up, and the chimney, once a conspicuous object from seaward has been destroyed.

A remarkable description of mat, made from leaves of the wild pineapple is sold here.

Cargo is landed at the jetty opposite the Custom House.

The best anchorage is in $4\frac{1}{2}$ to 5 fathoms, about $1\frac{3}{4}$ miles from the shore, with the Flagstaff bearing N. 85° W. magnetic, and the southernmost Chillumbram Pagoda S. 47° W. magnetic.

Cuddalore and Porto Novo.

South Arcot District.

Between Sunrise and 8 p.m.

| | | To vessels | | | | | |
|---|----------|---|-----|----|-----------------------------------|-----|----|
| | | In 7 fathoms low water and not outside of 10 fathoms low water. | | | In less than 7 fathoms low water. | | |
| | | Rs. | As. | P. | Rs. | As. | P. |
| Accommodation boat | per trip | 7 | 0 | 0 | 3 | 8 | 0 |
| Do. return trip from same vessel . . . | | 3 | 8 | 0 | 1 | 12 | 0 |
| Do. „ „ different vessel . . . | | 7 | 0 | 0 | 3 | 8 | 0 |
| Cargo boat | per trip | 6 | 0 | 0 | 3 | 0 | 0 |
| Do. return trip from same vessel . . . | „ | 3 | 0 | 0 | 1 | 8 | 0 |
| Do. „ „ different vessel . . . | „ | 6 | 0 | 0 | 3 | 0 | 0 |
| Do. carrying ballast | „ | 7 | 0 | 0 | 4 | 0 | 0 |
| Tapal boat | „ | 3 | 0 | 0 | 1 | 8 | 0 |
| Water boat | „ | *7 | 0 | 0 | *4 | 0 | 0 |
| Catamarans | „ | 0 | 12 | 0 | 0 | 6 | 0 |
| Do. for rafting timber for each catamaran per day | | 2 | 12 | 0 | 1 | 6 | 0 |

Transshipping.

| | | | | | | | |
|--|--|---|----|---|---|----|---|
| For the first trip, in addition to the ordinary fare . . . | | 1 | 0 | 0 | 1 | 0 | 0 |
| For each succeeding trip per day | | 0 | 12 | 0 | 0 | 12 | 0 |

Extraordinary Charges.

Between 8 p.m. and 4 a.m., provided that the boat proceeds

outside the bar after 8 p.m. Double hire.

Between 4 a.m. and sunrise An ordinary fare and a half.

When surf or current flag is hoisted Double hire.

When any increase to the ordinary crew is considered

necessary by the Port Conservator 8 Annas per day for each extra man engaged.

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

The Coleroon shoal is $5\frac{1}{2}$ miles south of Porto Novo, and extends about 2 miles seaward, with 3 to $4\frac{1}{2}$ fathoms of water on its outer edge, and 11 to 12 fathoms close to. The northern and most dangerous part bears *S. 79° E.* from the Porto Novo flagstaff, and

* These charges include filling casks, providing ropes, etc., and hire of boats.

when the south Chillumbram pagoda is open of the Coleroon wood a steamer is abreast the south end of the shoal.

Thirumalavasa is a small port in the Tanjore District, about 13 miles north of Tranquebar.

Steamers occasionally call here, and about 60,000 bags of rice and paddy are exported annually to Ceylon.

One of the branches of the Cauvery discharges itself into the sea near the town, and there is a pagoda close to the mouth of the river.

There are sufficient boats and men for the requirements of the port.

The best anchorage is with the Flagstaff bearing from *W.* to *W.S.W.*, in not less than 5 fathoms, the anchorage should be approached with caution as the soundings shoal rapidly inside the 5 fathom line.

The Flagstaff from top of masonry platform to truck is 70 feet It is $2\frac{1}{4}$ cables from line of beach.

From the Flagstaff the port pillars (white) and the river mouth bear as follows :—

| | | |
|-------------|-----------------------------|--------------------------------|
| N. pillar | N. $\frac{1}{2}$ W. | distant $9\frac{1}{2}$ cables. |
| S. „ | S.E. by S. $\frac{1}{2}$ S. | „ $4\frac{1}{2}$ „ |
| River mouth | N.E. by N. $\frac{1}{2}$ N. | „ $3\frac{1}{2}$ „ |

Position of river mouth is said to vary, however.

With the Flagstaff bearing *S.W.* by *W.* $\frac{1}{2}$ *W.*, the soundings are as follows :—

| | |
|--------------------------|--------------------|
| 2 cables from the beach, | 19 feet sand. |
| 3 „ „ „ | 27 „ „ |
| 4 „ „ „ | 31 „ stiff mud. |
| 5 „ „ „ | 32 „ mud and sand. |
| 6 „ „ „ | 36 „ „ „ |
| 7 „ „ „ | 38 „ soft mud. |
| 1 mile „ „ | 41 „ mud. |
| 1·2 „ „ „ | 45 „ hard mud. |

Tranquebar, in Latitude $11^{\circ} 1' 37''$ N., Longitude $79^{\circ} 53' 44''$ E., was purchased by the Danes from the Raja of Tanjore, and the first Danish vessel arrived in India in 1616. The Captain wrecked his ship here, and all the crew were murdered. Tranquebar was captured by the English in 1807, restored in 1814, and finally purchased by the English in 1845. In Danish times it was a busy port, but it is now half ruined, and its large export trade disappeared

when the construction of the South Indian Railway was completed from Negapatam to Tanjore in 1861, and to Trichinopoly in 1862. Some fine old buildings still remain, and the fort on the beach is in good preservation. Some Danish missionaries still reside here, and the pioneer Keirnander lived here for many years.

It is frequented by native vessels, and an occasional British India steamer calls here for passengers to Mauritius and elsewhere.

The name is a corruption of the old romantic Tamil designation of Tarangambadi, "the village of the wave." The city is built on the edge of the sea, and the relics that are left show what a magnificent town it was in the days of its prosperity.

The Protestant church was the first missionary church in India, and the Zion church was built in the beginning of the 18th century, as the tombs and tablets testify.

The old castle is now a wreck, but very picturesque, as it stands on the ramparts overhanging the sea.

It is proposed to connect the town by a branch railway with the South Indian Railway system, which will, without doubt, improve the trading facilities of the port, and perhaps restore it to its former commercial importance.

The best anchorage is in $4\frac{1}{2}$ fathoms, about a mile from the shore, sand and mud, with the Flagstaff bearing *N. 76° W.*

Karikal, or Karúkkál, Tamil Fish-pass, is a French town and settlement. The town came into British possession on four different occasions, first in 1760, but it was finally restored to the French in January, 1817.

There is a brisk trade in rice and paddy with Ceylon throughout the greater part of the year, and there is also a regular business carried on with the Straits Settlements, both in cargo and passengers. It is a regular port of call for the British India Company's steamers to Singapore.

An emigration society derive much profit from the exportation of Indian labourers to Bourbon, Cayenne, Guadaloupe, and Martinique.

The best anchorage is in 4 to $4\frac{1}{2}$ fathoms, soft muddy bottom, and excellent holding ground, with the Flagstaff bearing *W.* In the *S.W.* monsoon it is better to anchor a little further north.

The yard on the Flagstaff is 60 feet above the top of the masonry platform on which the staff is stepped, the lantern is 37 feet above the same level. The Flagstaff is about $1\frac{1}{2}$ cables from the line of beach.

The Port Pillars are striped horizontally black and stone colour, and bear from Flagstaff as follows :—

N. Pillar, *N.N.E.*, distant 3 cables.

S. „ *S. by E. $\frac{1}{2}$ E.* „ 3 $\frac{3}{4}$ „

With the Flagstaff bearing *W. by S.* the soundings are as follows :—

| | |
|----------------------|----------------|
| 2 cables from beach, | 20 feet sand. |
| 3 „ „ | 24 „ „ |
| 4 „ „ | 25 „ „ |
| 5 „ „ | 28 „ mud. |
| 6 „ „ | 30 „ soft mud. |
| 7 „ „ | 30 „ „ |
| 8 cables or 1 mile „ | 33 „ „ |
| 1·3 miles „ | 38 „ „ |

The Light, in Latitude $10^{\circ} 55' N.$, Longitude $79^{\circ} 50' 35'' E.$, is situated at the mouth of the Arselar river, and is a fixed, white light ; it is visible from all directions seaward, and can be seen 9 miles in clear weather. It is 42 feet above high water level.

The port is under the charge of a Harbour Master. It is a free port, but its peculiar position admits of many opportunities of easy smuggling, in spite of the convention which exists with the Madras Government.

There is a well organized boat service, and there are sufficient men for the requirements of the port.

When the surf is heavy a blue flag is displayed at the Flagstaff.

The principal exports are rice and paddy, cocoanut oil, sesame, and coir.

The imports are sugar, timber, sandalwood, and French goods and liquors.

The cargo is discharged at the jetties in the river. There is 8 feet of water over the bar at high water.

Nagore, in Latitude $10^{\circ} 49' 26'' N.$, Longitude $79^{\circ} 53' 24'' E.$, is 3 miles north of Negapatam and officially included within that Municipality. It was ceded to the English by the Raja of Tanjore in 1778.

The harbour is conveniently situated at the mouth of the River Vettár, and a small trade is still carried on by native craft with Burma and the Straits Settlements.

It is the site of the ancient "Thelleyr," and has a celebrated mosque and minaret, 148 feet high, which is resorted to during the

annual feast by many Muhammedan pilgrims from all parts of India.

These Mosques are an excellent landmark from seaward, and can be seen 12 to 15 miles away.

Should the railway from Negapatam be extended to this place, as is contemplated, the trade will no doubt again improve, as the river is much more suitable for landing and shipping cargo and passengers than that at Negapatam, and is a more convenient harbour.

There are three small sandy shoals between Nagore and Negapatam, just outside the five fathom line, and $2\frac{1}{2}$ miles from the shore.

The southern shoal, with 27 feet on it, lies with Negapatam Lighthouse *W.* by *S.* $\frac{1}{2}$ *S.* $2\frac{1}{10}$ miles.

The middle shoal with the Lighthouse *S.W.* by *W.* $\frac{3}{8}$ *W.*

The northern shoal with the Lighthouse *S.W.* $\frac{7}{8}$ *W.* $3\frac{1}{10}$ miles.

The most conspicuous landmarks when approaching this part of the coast, are Nagore minarets, five in number, the Negapatam Lighthouse, the two chimneys of the South Indian Railway workshops, two large Hindu temples in the town of Negapatam, and a Church spire about 1000 feet *N.W.* of the Lighthouse.

Negapatam, or "Nagai-pattanam," "Snake-town," Negamos, Greek, Negama-metrop, Latin; according to Colonel Yule it is the Malefattan of the Arab geographers, and the City of Choramandel of the early Portuguese. It was one of the earliest settlements of the Portuguese. It was taken by the Dutch in 1660, and from them by the English in 1781.

There is a population of over 60,000, 20 per cent. of whom are Labbais, half Arab, half Hindu in origin. They are a bold, active, and thrifty race and have established prosperous colonies in Ceylon, Burma, and the Straits Settlements. They are keen traders.

The port carries on an active and increasing trade with Ceylon, the Straits Settlements and Burma.

There is also a large passenger trade with the Straits Settlements by the British India Company's and other steamers, and great quantities of cattle and other live stock are exported annually. The principal exports are rice and paddy, cattle, earthenware, ground nuts and oil, copra, castor seed, ghee, poonac, and dyed piecegoods, valued at 8,000,000 Rupees.

The imports are principally coal, timber, railway material, grains, pulse, and supari, valued at 5,000,000 Rupees.

It is a regular port of call for the British India and Asiatic coasting steamers, and a large number of native brigs and barques are owned at and sailed from this port.

The Light, in Latitude $10^{\circ} 45' 30''$ N., Longitude $79^{\circ} 50' 20''$ E., is situated on the jetty, close to the mouth of the river, and is a fixed, white, dioptric light of the 4th order, illuminating from N. 5° W. through West to S.S.E., standing 79 feet above high water level, and visible in clear weather 14 miles. The Lighthouse column is built of stone, and is painted white.

A red light is shown from the end of the jetty, to guide the boats over the bar.

The best anchorage is with the Lighthouse bearing W. by N. to W.S.W., in 4 to 5 fathoms, sand and mud, and good holding ground, or with the Lighthouse bearing W. and the highest Nagore Tower N.W., in $3\frac{1}{2}$ fathoms.

Or with the Lighthouse and the centre of the large passenger shed on the jetty in one, in 4 fathoms.

Or the wreck buoy and the tallest Nagore Tower in one, in $4\frac{1}{2}$ fathoms.

Steamers discharging timber should always anchor well to windward, to enable the rafts to get ashore easily.

A green buoy is laid down in 4 fathoms, $1\frac{1}{4}$ miles from the shore, to mark the spot where a barque sank in 1881. All traces of the wreck have disappeared, but the buoy is a useful guide to the anchorage.

There are 120 cargo boats with a total capacity of 700 tons, and there are sufficient boatmen for the requirements of the port. The cost of working cargo is from 3 to 6 Annas a ton, and landing and shipping costs from 12 Annas to 1 Rupee 8 Annas a ton according to the season and the nature of the cargo.

The port is under the charge of a Port Officer, who is also Superintendent of Mercantile Marine, Registrar of Shipping, and Emigration Officer.

He is in charge also of all the dredging operations.

Fresh provisions are abundant and cheap.

Coal can be procured from the railway authorities.

Fresh water will be supplied at the rate of 1 Rupee per 100 gallons alongside.

The daily weather signals are displayed from the Lighthouse during the forenoon.

Repairs to machinery and castings can be executed at the railway workshops, which are under experienced European supervision.

Most of the cargo is landed at the jetty at the mouth of the river, and there are 3 cranes of 14, 5 and 3 tons respectively for lifting heavy weights. The charges are moderate.

There are no hospital dues. European seamen and lascars are admitted into the hospital. The former pay 10 Annas per day, and the latter 4 Annas.

Negapatam shoal, composed of hard sand and stones, and having less than 3 fathoms on it, is situated 4 miles from the shore, in Latitude $10^{\circ} 36' N.$, Longitude $79^{\circ} 55' E.$

Shoal water extends $3\frac{1}{2}$ miles north and $2\frac{1}{2}$ miles south of this position.

There is a channel between the shoal and the main, but it is not buoyed, and should be used with caution by small steamers.

**Negapatam, Nagore, Tirumalavasal, Tranquebar,
Topputurai, Mutupet, Adirampatam,
and Valangani.**

Tanjore District.

Between Sunrise and 8 p.m.

| | To vessels. | | | | | |
|--|---|-----|----|--|-----|----|
| | In and under 5 fathoms low water. | | | Beyond 5 fathoms and not outside of 6 fathoms low water. | | |
| | Rs. | As. | P. | Rs. | As. | P. |
| Accommodation boat per trip | 1 | 8 | 0 | 2 | 4 | 0 |
| Do. return trip from same vessel . . . | 0 | 12 | 0 | 1 | 2 | 0 |
| Do. „ „ different vessel . . . | 1 | 8 | 0 | 2 | 4 | 0 |
| First class cargo boats when carrying ordinary cargo, per trip | 3 | 0 | 0 | 4 | 8 | 0 |
| First class cargo boats when carrying railway material or coal per trip | 4 | 0 | 0 | 6 | 0 | 0 |
| Second class boats „ | 2 | 4 | 0 | 3 | 6 | 0 |
| Return fare for first and second class boats from same vessel | Half ordinary rate. | | | | | |
| Return fare for first and second class boats from different vessel | Full rates. | | | | | |
| Catamarans per trip | 0 | 8 | 0 | 0 | 12 | 0 |

To face page 159.

On 1st September, 1902, Calimere Light will be altered to a flashing white light every 45 seconds, visible 12 miles in clear weather.

Transshipping.

First and second class boats—

For the first trip, in addition to the fare for an ordinary trip

Two-thirds of the ordinary fare trip allowed to the class of boat according as the work is carried on in and under 5 fathoms, or outside of 5 fathoms, low water.

For each succeeding trip during the day

Half the ordinary fare allowed to the class of boat according as the work is carried on in and under 5 fathoms, or outside of 5 fathoms, low water.

Extraordinary rates.

Between 8 P.M. and 4 A.M., provided the boat proceeds outside the bar after 8 P.M. per trip

Double rates.

Between 4 A.M. and sunrise „

An ordinary rate and a half.

When surf or current flag is hoisted per trip

Double rates.

When any increase to the ordinary crew is considered necessary by the Port Officer or Port Conservator of the port per trip

Annas 4 for each extra man.

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Point Calimere (the Calligicum of Ptolemy) is a low promontory, forming the southernmost point of the Coromandel Coast.

The Light, in Latitude $10^{\circ} 18' 00''$ N., Longitude $79^{\circ} 51' 30''$ E., is situated on the Point, about 30 miles South of Negapatam.

It is a fixed, red, dioptric light of the 6th order, illuminating an arc of 360° , standing 49 feet above high water level, and visible in clear weather 6 to 8 miles.

The Light is exhibited from a steel mast painted white, and is intended to guide vessels passing between the point and the shoals to the eastward.

About $5\frac{1}{2}$ miles *N.N.W.* of the point and a mile in shore, there are 2 dark looking pagodas, which when in line bear West.

The 3 fathom bank extends about 5 miles *E.N.E.* and *S.S.W.* from the point, and about 2 miles to the *S.E.*, there are also detached patches with less water. The channel between these shoals and the main has only 20 feet in it, and can only be used by small vessels.

Adrampatam, or "Adwara Ramapatam," in Tamil "The City of the great hero Rama," is a seaport in Latitude $10^{\circ} 20' 10''$ *N.*, Longitude $79^{\circ} 25' 40''$ *E.* A considerable native trade is carried on by the native craft with Ceylon and Southern India, and the small steamers belonging to the British India call here occasionally. There are also extensive fisheries and salt manufacture.

The sharp angle of the coast immediately above it protects the port, and the anchorage is consequently good in the *N.E.* monsoon, and having a soft, muddy bottom native vessels look upon it as a harbour of refuge, especially in May and September.

The best anchorage is with the centre of the town bearing North magnetic, and the Shallavenaikapatam pagoda bearing *W.* by *N.* magnetic, in 20 feet, very soft mud.

The pagoda is in Latitude $10^{\circ} 16' N.$, 6 miles *S.W.* of Adrampatam, and is visible from seaward 15 miles. It was erected in 1814 by the Rajah of Tanjore.

Kottaipatam is a small port, which may be known by a single tree and a plantation of high palmyra palms. The best anchorage is with the tree and plantation in one bearing *W.* by *N.*

Between this port and Adrampatam there is a long sand spit, with from 1 to 3 fathoms on it. It stretches *E.* by *S.* 15 miles from a low protruding point about 5 miles to the northward of Kottaipatam. There is generally a confused sea on this spit, and it should not be approached nearer than 5 fathoms.

Tondi is a port of some importance to the native trade, and it is also a port of call for the small British India Steamers between Colombo and Negapatam. The best anchorage is with the centre of the town bearing *N.* 68° *W.* magnetic. The 3 fathom line is $3\frac{1}{2}$ miles from the shore, but light draught vessels can anchor closer in, and the bottom is soft mud.

The Commander of the *S. S. Aska* reported a depth of 10 feet sand at low water, in a position $3\frac{1}{2}$ to 4 miles *S. E.* of Pasipatam

To face page 161.

Tondi Light has been altered from a fixed red to a fixed white light.



PANBAN LIGHTHOUSE.

mosque; and 14 feet with Tondi Custom House *W. ½ S.* and Pasipatam mosque *S.E.*

Tondi Light, in Latitude $9^{\circ} 44' 45''$ *N.*, Longitude $79^{\circ} 0' 30''$ *E.*, is situated about 14 yards south of the Sea Custom House and is a fixed, red, dioptric light of the 6th order, standing 63 feet above high water level, and visible 6 to 8 miles in clear weather from all directions seaward. The light is exhibited from a steel mast.

Pamban, "pambu," a snake, said to be named from the character of the channel.

In early days this gap was probably bridged by a continuous isthmus, and the ancient records preserved in the temple of Rameswaram relate that in 1480 a violent storm breached the isthmus, and that despite efforts to restore the connection, subsequent storms rendered the breach permanent.

The passage was formerly impracticable for ships, being obstructed by two parallel ridges of rock, about 140 yards apart.

Sir Arthur Cotton surveyed it in 1822, and the operations for deepening and widening the channel commenced in 1838 and have been continued ever since.

In 1844 the channel was deepened to 8 feet at low water, and two small gunboats passed through. Ten years later the uniform depth was $10\frac{1}{2}$ feet at low water springs, and the total expenditure up to that time was over thirty-two thousand pounds sterling. The main channel, through the larger reefs of rocks, has now been carried to a minimum depth of 14 feet. Its length is 4,232 feet with a width of 80 feet.

There is a second passage to the south of the main one, called Kelkari passage, which is 2,100 feet long and 150 feet wide, and has been dredged through a sandbank to the depth of 12 feet.

The traffic passing by the Pamban Passage is mostly of a coasting nature, between Ceylon and the mainland. The small coasting steamers of the British India and Ceylon Steamship Companies use the pass weekly, and hundreds of native craft of all rigs and sizes pass through to and from Chittagong, Burma, and East Coast ports, to the ports in Malabar and South Canara on the West Coast.

It is proposed to connect Ceylon and India by railway in the near future, and the Madura and Pamban Railway is now under construction.

The title of Adam's Bridge is from the Muhammedan tradition

that Adam on his expulsion from Paradise crossed to Ceylon by this bridge. The Tamil name, Shēthu, means artificial bund and it is also called "tiruvanai" which means holy bund.

The sanscrit name "nala setu" means the monkey bund as the army of monkeys are supposed to have constructed the causeway.

It is a narrow ridge of sand and rocks, mostly dry, nearly closing the Gulf of Manaar on the north and north east. The western extremity joins the eastern point of Ramesaram Island; the eastern extremity joins the eastern point of Manaar Island and with these two islands almost connects Ceylon with India.

It is called the Bridge of Rama by Hindus, as along it Rama aided by Hanooman with his host of monkeys marched, when invading Ceylon.

It really joined Ceylon to India until 1480 A.D., when a breach was made through the rocks during a storm.

A subsequent storm enlarged the breach, and foot traffic then ceased.

It is partly above and partly below water, about 30 miles long and $1\frac{1}{4}$ miles broad, *S.E.* to *N.W.*

If ocean going steamers are ever destined to run inside Ceylon, it is thought the best route will be through a ship canal, across either the peninsula of Ramnad or the Island of Rameswaram.

Mr. Mitchell, the Chief Engineer of the new Pamban Railway, reports that when the line is opened to Mandapam, a new port of very great importance will be open, with a bright future before it.

The port and town are situated on a narrow peninsula, between Palks Bay and the Gulf of Manaar.

A survey to connect Mandapam with the harbour was made three years ago, and it is now proposed to continue the line from Mandapam to Point Ramen, and thence on a causeway across the Pamban Reef, $1\frac{1}{4}$ miles in length, and so connecting with the Island of Rameswaram. A small opening would be provided for country vessels at the Pamban end, and a swing bridge over the pass would also be constructed, having a clear span of 130 feet.

The new harbour would be about 3 miles from Pamban. It is proposed to provide ample accommodation for goods and passengers at the Harbour Railway Station, and to erect a new pier 1800 feet long, at which vessels drawing up to 26 feet could lie alongside and discharge cargo at all seasons of the year.

The harbour is sheltered by the Puli and other reefs on the south and west, and the existing channel would have to be filled in to make the harbour absolutely protected in the south west monsoon.

A *S.E.* wind would blow directly into the harbour, but wind from that quarter is of short duration, and of very rare occurrence.

The town of Pamban derives its name from the passage, and is situated on the western extremity of Rameswaram Island, commanding the channel.

The Ceylon Government have an immigration depôt, and this, with the constant influx of pilgrims from every part of India, and the grain trade, gives the port an appearance of activity. At one time the place was of importance on account of the pearl fisheries, and the Labbais are now employed as pilots, divers, and in other scafaring pursuits.

The passage is bounded on the west by a reef of rocks, called the Great Dam, which is almost covered at high water, extending $1\frac{1}{4}$ miles from the point known as Toni-Torai or Point Ramen; on the east by the Island of Rameswaram.

The steamers that pass through vary from 200 to 800 tons, which is quite large enough to be navigated with safety, the narrowest part of the channel being only 200 feet wide, namely, the cutting through the reef.

The maximum draft is 11 feet 6 inches, but in one or two instances foreign vessels of greater draft, who were in a hurry to save their charters, have been taken through in calm weather and at the top of spring tides.

The channel is continually silting up in one part, owing to the strong current, which sometimes runs as much as 6 or 7 knots an hour through the reef cutting during the height of the monsoons.

The depth is consequently never the same throughout, and the channel requires dredging every three or four years.

As the port is almost unknown to the Commanders of foreign vessels and outside steamers, and is very rarely used, except by the coasters, shipmasters wishing to use the pass should wire to the Port Officer for the necessary information.

It is a dangerous place to approach from the southward, and it should never be attempted at night time, on account of the low outlying islands and coral reefs, which have deep water close to their edges.

It is safe to approach from the northward, but the land is low, the most conspicuous object being the temple of Paruvadam.

Closer to the entrance the Lighthouse is a good mark. The tripod and pass ball in line lead to the entrance of the pass.

The best anchorage to the north of the pass is in 20 to 23 feet of water, sand and mud, with good holding ground, and the Pamban Lighthouse bearing from *S.W.* to *E.S.E.* magnetic, distant about 1 mile.

The best anchorage south of the pass is with the beacon on Shingle Island (white with black band) bearing from *S.* to *S.W.* magnetic, in 19 to 23 feet of water, sandy bottom.

Kundugal Harbour anchorage is between Kundugal post, marking the end of the spit, and the *S.E.* buoy of the sandbank channel in line, in 12 to 15 feet of water, sand and mud.

The Toniturei temple stands 200 yards from Ramen Point.

The south end of Kanthè Thuki reef is marked by a post.

The northern entrance to the pass is marked by a large buoy, with the Lighthouse bearing *E.* by *S.* $\frac{3}{4}$ *S.*, and a red buoy is moored in the centre of the pass, and the sides are marked by posts.

A post lies at the end of the Sandbank Channel, and the beacons on Kurisuddi Island and the reef in line lead through this pass, and 2 red buoys mark the elbow of the channel, and are moved from time to time as the channel changes.

The extreme point of Kundagul Point is marked by a beacon, and a post marks the edge of the shoal.

Pulli Island is marked by a beacon, 30 feet high, and painted white.

Puma East Channel, between the reef and Horse Shoe Bank, is marked at the western end by two posts, and there is also a post at the eastern end, at a spot where there is only 3 feet of water.

Pilotage is compulsory ; the pilots are always on the lookout for vessels and board them in their canoes, flying a small red flag with their number.

From the south there are two entrances, one viâ the Puma Channel, which is only used by natives who know the place well, and the other between Shingle Island and Kundagal Point, which is used by steamers, and recommended to strangers, but should never be attempted at night time.

Both the southern entrances are protected from the *N.E.* monsoon, and the northern anchorage is similarly sheltered from the *S.W.* monsoon.

It is high water, full and change of the moon, at 1 hour 50 minutes, and spring rise 3 feet, and sometimes at neap tides the water remains at the same level throughout.

The depth of water varies according to the prevailing wind. During the strong *S.W.* monsoon the water in Palks Bay recedes 9 inches to 1 foot 3 inches below its normal depth, and again in the *N.E.* monsoon there is almost the same difference south of the pass.

The Light, in Latitude $9^{\circ} 17' 14''$ N., Longitude $79^{\circ} 12' 38''$ E., is situated on a sandhill, about one mile to the eastward of the Northern Channel.

It is a fixed, white, dioptric light of the 4th order, illuminating an arc of 360° , standing 97 feet above high water level, and visible in clear weather 14 miles.

The Lighthouse is built of stone and is painted white, and is intended as a guide to vessels making for the Pamban Channel.

It is intended to replace this light by a group occulting light showing groups of four occultations every minute.

There are sufficient boats and men for the requirements of the port. Good sailing boats, from 5 to 15 tons, can be hired at from 2 to 6 Rupees a day. There are no tugs.

Fresh water is good, and can be supplied at the rate of 1 Rupee per 100 gallons.

No coal, stores, or provisions.

There is an hospital where Europeans are admitted, attendance free.

A Superintendent of Sea Customs is stationed here. Duty as per Indian Tariff Act.

The only imports are rice, paddy, and grains.

The exports are salted fish, palmyra fibre, cocoanuts, and coral for building purposes.

Pamban.

Madura District.

| | Fair weather with tide or at slack water. | | | Against tide in either fair or foul weather. | | | Foul weather with tide or at slack water. | | |
|--|--|-----|----|---|-----|----|--|-----|----|
| In respect to cargo. | | | | | | | | | |
| <i>Cargo Boats.</i> | Rs. | As. | P. | Rs. | As. | P. | Rs. | As. | P. |
| For each trip either to the north roadstead on the basin to import or export goods to and from the Custom House | 2 | 0 | 0 | 3 | 0 | 0 | 4 | 0 | 0 |
| For each trip to Terkey Pallum roadstead on the basin to import or export goods to and from the Custom House | 1 | 0 | 0 | 1 | 8 | 0 | 2 | 0 | 0 |
| For each trip to Koondoogal Harbour roadstead on the basin to import or export goods to and from the Custom House | 4 | 0 | 0 | 6 | 0 | 0 | 8 | 0 | 0 |
| For each trip to lighten vessels by receiving goods at the north roadstead and delivering the same at the basin or <i>vice versa</i> | 3 | 0 | 0 | 5 | 0 | 0 | 6 | 0 | 0 |
| For each trip to lighten vessels by receiving goods at Koondoogal Harbour or <i>vice versa</i> | 5 | 0 | 0 | 7 | 8 | 0 | 10 | 0 | 0 |
| In lightening vessels, should a laden boat not be discharged in 24 hours, for every suc- ceeding day | 1 | 0 | 0 | 1 | 8 | 0 | 2 | 0 | 0 |
| Hire of a cargo boat per day without the crew | 7 | 0 | 0 | 10 | 8 | 0 | 14 | 0 | 0 |
| Hire of a cargo boat per day without the crew to be alongside vessels, oar the cargo, or such other job | 1 | 0 | 0 | 1 | 8 | 0 | 2 | 0 | 0 |
| Canoes. | | | | | | | | | |
| For each trip to the north roadstead, to any part of the channel with goods, passengers or letters | 0 | 4 | 0 | 0 | 8 | 0 | — | | |
| For each trip to Koondoogal Harbour with goods, passengers or letters | 0 | 8 | 0 | 1 | 0 | 0 | — | | |
| Transshipping rates | Per ton 0 8 0 | | | Per ton 0 12 0 | | | Per ton 1 0 0 | | |
| Detention hire | Per hour 1 0 0 | | | Per hour 1 8 0 | | | Per hour 2 0 0 | | |
| Water boat (irrespective of weather or tide) . | 1st class boat 10 0 0 | | | 2nd class boat 8 0 0 | | | 3rd class boat 5 0 0 | | |

(a) All boats and dhonies and canoes will be entitled to half the amount of hire if returned unused by parties engaging them after the boats have put off from the shore.

(b) No cargo or passengers shall be carried in excess of the quantity or number specified in the license.

(c) In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the port, the Port Officer shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Scale of Pilotage Fees at the Port of Pamban.

(G. O., Marine, No. 196, of 4th June, 1875.)

| | | | | | | Per foot. | | |
|---|---|---|---|---|---|-----------|-----|----|
| | | | | | | Rs. | As. | P. |
| Upon all vessels drawing 3 feet water and under | . | . | . | . | . | 0 | 9 | 0 |
| " " " 4 feet and over 3 feet | . | . | . | . | . | 0 | 10 | 0 |
| " " " 5 " 4 " | . | . | . | . | . | 0 | 11 | 0 |
| " " " 6 " 5 " | . | . | . | . | . | 0 | 13 | 0 |
| " " " 7 " 6 " | . | . | . | . | . | 0 | 15 | 0 |
| " " " 8 " 7 " | . | . | . | . | . | 1 | 4 | 0 |
| " " " 9 " 8 " | . | . | . | . | . | 1 | 9 | 0 |
| " " " 10 " 9 " | . | . | . | . | . | 1 | 14 | 0 |
| " " " 11 " 10 " | . | . | . | . | . | 2 | 8 | 0 |
| " " " 12 " 11 " | . | . | . | . | . | 3 | 2 | 0 |
| " " " 13 " 12 " | . | . | . | . | . | 3 | 12 | 0 |

The draught will be calculated in even feet, a vessel of $3\frac{1}{2}$ feet being charged at 4 feet, or 2 Rupees 8 Annas, and one of less than $3\frac{1}{2}$ feet at 3 feet, or 1 Rupee 11 Annas.

Scale of charges for the Pamban Channels.

(G. O., Marine, No. 196, of the 4th June, 1875.)

| | Fine weather. | | | Foul weather or strong current. | | |
|---|---------------|-----|----|---------------------------------|-----|----|
| | Rs. | As. | P. | Rs. | As. | P. |
| Hire of warps | 1 | 0 | 0 | — | | |
| Hire of grapple | 1 | 0 | 0 | — | | |
| Warping canoe with 5 men | 1 | 14 | 0 | 2 | 4 | 0 |
| Extra men for one tide | 0 | 3 | 0 | 0 | 5 | 0 |
| Do. if a longer period, for every eight hours | 0 | 4 | 0 | 0 | 6 | 0 |

Pilotage Charge for Kelakary Channel.

(Government Notification, Fort St. George Gazette, 1st August, 1854.)

10 Annas per foot of a vessel's draught.

Kilakarai (probably the Korkhoi of the Periplus) is in Latitude 9° 14' 20" N., Longitude 78° 50' 10" E., and is situated near the mouth of the Gundar.

The natives say the town was built by the Pandya kings, to commemorate the place where a great rainstorm detained them for a month when on their way to some marriage celebration.

The trade has been diverted to a great extent to Tuticorin, but it is still used as a place for repairing native craft.

Between Kilakarai and Tuticorin large vessels should not approach the coast nearer than 6 miles as there are numerous shoals scattered about with 3 fathoms on them, which the small steamers can pass over. When the large trees of Patnurmudur bear northward of *W.* a vessel will be clear of the shoals.

Tuticorin (Tuttukudi) is an important port and as regards trade stands second in the Presidency after Madras, and sixth in all India.

Its appearance is very unattractive, and the subsoil is so shallow in parts that no trees or plants will grow, and though the average rainfall does not exceed 20 inches, any heavy shower causes some inconvenience from want of proper drainage.

It is the principal outlet to the large cotton producing district of Tinnevely, and the trade has much increased since the opening of the South Indian Railway in 1875, of which Tuticorin is the southern terminus.

On the north of the town there are two tall factory chimneys, which can be seen 12 miles, and the Flagstaff; on the south side there is a Roman Catholic Church and some cotton presses.

The chief exports are cotton, palmyra jaggery, coffee, cinchona, senna, cardamoms, chillies, fibre, oil-cake, areca nut, and hides and skins.

The imports are principally piecegoods, hardware, spirits, grains, timber, machinery, and manufactured goods.

Rice is exported to Ceylon, and large numbers of cattle, sheep, and poultry are sent every week by the small coasting steamers. There is also a very large native passenger traffic with Ceylon, and numbers of native owned sailing vessels ply to Ceylon and Indian Coast Ports.

The harbour is well sheltered, but is only eight feet deep, and near the town and jetty not more than four feet.

The port has now been provided with a handsome iron screw pile pier 600 feet long. There is also a small wooden jetty for light work, and some of the large European firms have private jetties for their own purposes.

There is a Government crane capable of lifting five tons, and several smaller ones.

The port is under the charge of a Port Officer, who is also Superintendent of the Pearl and Chank Fisheries.

Large steamers have to anchor $5\frac{1}{2}$ miles from the town, and the cargo is brought out in well built, fast sailing boats of about 20 tons burthen.

The British India Company run a daily steamer to and from Ceylon, and their regular coasting steamers call here once a week from Bombay and Calcutta, besides several extra steamers. The Asiatic steamers call here at regular intervals.

A Japanese line of steamers call here regularly, and many large vessels load here with cotton and jaggery for the United Kingdom and the Continent.

There are many wealthy European merchants, and several fine cotton presses.

The best anchorage is in 6 fathoms, with Hare Island Lighthouse bearing from *N.* 68° *W.* magnetic, to *N.* 79° *W.* magnetic, about $1\frac{3}{4}$ miles distant, and with the Port Flagstaff just open of the North end of Hare Island. The bottom is sand, and rocky in places and not good holding ground, and steamers remaining any length of time are recommended to anchor with a good scope of cable out.

The small steamers and native craft can anchor closer in, in 20 feet of water.

The principal landmarks when approaching Tuticorin are those already mentioned in the town, and Trichendore Pagoda, $17\frac{1}{2}$ miles *S.* by *W.* from the Lighthouse. It can be seen 18 to 20 miles in clear weather. When first sighted it looks like a ship under full sail.

There are also two remarkable red hills, 10 miles to the westward of Tuticorin.

These hills can usually be seen, long before either Trichendore Pagoda or Tuticorin Lighthouse. The higher of the two hills bears from Hare Island Lighthouse *W.* by *S.*, $19\frac{1}{2}$ miles distant.

The Light, in Latitude $8^{\circ} 47' 10''$ *N.*, Longitude $78^{\circ} 11' 20''$ *E.*, is situated on the extreme northernly point of Hare Island, $2\frac{1}{2}$ miles East of Tuticorin town.

It is a fixed white dioptric light of the 4th order, illuminating an arc of 360° , and visible from all directions seaward, standing 85 feet above high water level, and is visible in clear weather 14 miles.

The Lighthouse is built of sand stone and is coloured brown, the lantern being painted white.

It is high water, full and change, at 2 hours 2 minutes, springs rise $3\frac{1}{4}$ feet, neaps $1\frac{3}{4}$ feet.

European and native seamen are admitted into the hospital free of charge.

There are 52 large boats, with a total capacity of 1600 tons, and 400 boatmen are always available.

Labour is abundant and inexpensive. The cost of working cotton is 5 Annas a ton, working railway material about 6 Annas a ton, jaggery 4 Annas a ton, salt 3 Annas a ton, and general cargo 3 to 5 Annas a ton.

Landing and shipping costs from 10 Annas to 1 Rupee a ton; railway material and awkward cargo about 25 per cent. more.

Fresh water can be put on board at 8 Annas per 100 gallons, but is very difficult to obtain.

Coals can be obtained at 25 Rupees per ton alongside, but are not easy to obtain.

Marine stores are not procurable, but fresh provisions of all sorts are good and fairly cheap.

Small repairs can be executed at the workshops.

The weather is uncertain from May to July, the port, however, is seldom visited by gales of sufficient force to interfere with shipping operations.

Coilnapatam is a small port where steamers occasionally call to load salt. It is 15 miles from Tuticorin and 17 miles

from Kalasagrapatam. The best anchorage is on the following bearings :—

| | | |
|----------------------------|-----------|--------------------------|
| Trichendore Pagoda . . . | S. 5° W. | } Magnetic 4 fathoms. |
| Conspicuous clump of trees | S. 45° W. | |
| Penacoil Church . . . | N. 87° W. | |
| Penacoil Peak . . . | N. 73° W. | |

Kalasagrapatam is a small port close to Manapad Point, and is an occasional port of call for the British India Coasting Steamers. It may be distinguished by the ruins of a large church, half buried in the sand, and the mouth of a small river opening into the Bay, to the north of Manapad Point.

Manapad Point is a high sandy promontory, jutting boldly into the sea, having an old church and Lighthouse on its summit. The breakers extend 3 or 4 miles to the *N.E.* of the point, and 1 mile to the *S.E.*

A dangerous shoal has its nearest part 5 miles *S.W.* from the Point, with a depth of from 4 to 7 fathoms, and 12 fathoms close to all round. It extends *E.N.E.* and *W.S.W.* 10 miles, and is about a mile broad. A tongue projects from the centre of the shoal in a northerly direction, the apex of which constitutes its northernmost or inner danger, and has $4\frac{1}{2}$ fathoms sand on it, with the Lighthouse bearing *N. 56° W.* magnetic, about 5 miles distant, and Trichendore Pagoda *N. by W.* magnetic, $12\frac{1}{2}$ miles distant. There is a safe channel between the point and the shoal.

Manapad Light, in Latitude 8° 22' 30" *N.* Longitude 78° 3' 30" *E.*, is situated on the summit of Manapad Point, 50 yards *N.E.* of the church.

It is a group flashing white light, showing two flashes in quick succession every 10 seconds, elevated 140 feet above high water and visible 18 miles in fine weather.

Tuticorin.*Tinnevely District.*

| | Boat hire to the roadstead or beyond Devil's Point. | | | Boat hire to near the Keystone Rock. | | | Boat hire to Therukaipallem. | | | Boat hire to inner harbour. | | |
|---|---|-----|----|--------------------------------------|-----|----|------------------------------|-----|----|------------------------------|-----|----|
| | Rs. | As. | P. | Rs. | As. | P. | Rs. | As. | P. | Rs. | As. | P. |
| <i>Between sunrise and 8 p.m.</i> | | | | | | | | | | | | |
| First-class boats, 16 to 22 tons, carrying 75 bales of cotton of 400 lbs. or 60 bales of 500 lbs. | 12 | 8 | 0 | 10 | 0 | 0 | — | — | — | 5 | 0 | 0 |
| Second-class boats, 12 to 16 tons, carrying 56 bales of 400 lbs. or 45 bales of 500 lbs. | 9 | 6 | 0 | 7 | 8 | 0 | — | — | — | 4 | 0 | 0 |
| Third-class boats, or small dhonies | 6 | 0 | 0 | 5 | 0 | 0 | 4 | 0 | 0 | 3 | 0 | 0 |
| Canoes for dubash purposes only (using not less than 6 oars) . | 3 | 0 | 0 | — | — | — | — | — | — | — | — | — |
| <i>Transshipping.</i> | | | | | | | | | | | | |
| For the first trip | Half hire. | | | | | | | | | | | |
| For each succeeding trip during the day | Do. | | | | | | | | | | | |
| Water trip including all charges | Full hire. | | | | | | | | | | | |
| Return trip | Half hire if from the same ship. | | | | | | | | | | | |
| Landing horses | Full hire. | | | | | | | | | | | |
| Do. carriages | Do. | | | | | | | | | | | |
| <i>Extraordinary rates.</i> | | | | | | | | | | | | |
| Between 8 P.M. and 4 A.M. per trip | — | — | — | — | — | — | — | — | — | Double rates. | | |
| Between 4 A.M. and sunrise per trip | — | — | — | — | — | — | — | — | — | An ordinary fare and a half. | | |

In cases of extraordinary service, as proceeding to a vessel in distress within the limits of the port, the Port Officer shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Special rules for observance at the Tuticorin port.

1. Every boat loaded or unloaded, returning from the shipping in the roadstead or harbour of Tuticorin shall touch at the Government Jetty for examination by the Sea

Customs Department, unless it has been exempted from doing so in writing by the Sea Customs Superintendent.

2. No passenger shall be landed or embarked at any other place than the Government Jetty.

The Tinnevelly Pearl and Chank Fisheries.

The Tinnevelly pearl banks, as is well known, form the most ancient fishery in the world. They are mentioned by Pliny, A.D. 130, and Ptolemy the Geographer, who lived about A.D. 138, tells us that when the Tamils of Southern India were in their golden age the Tinnevelly Pearl Fishery then established, according to him, at Kuru, the modern Coilpatam, paid tribute to the Pandyar Kings of Madura. They were mentioned by Abu Mahomed Bin Mauser in the 12th century, and by Marco Polo in the end of the 13th century.

Readers of the life of St. Francis Xavier are familiar with his account of the "Fishery Coast," a name which it retained in the letters of the Jesuit Fathers down to the time of the suppression of the order in 1773.

The Venetian Traveller Cæsar Frederic (1563-1581) describes the pearl fishery in a manner almost applicable to the present day.

Then, as now, the local divers were all Roman Catholics, and were known as Paravars.

When the Portuguese owned the banks it was the custom to give the products of one day's pearl fishing every season to the Jesuit Missionaries. They were succeeded by the Dutch, who obtained a monopoly of the fisheries from the King of Madura and derived a large revenue from them.

The English first engaged in the fisheries in 1796, since which time they have been continued, but have been very uncertain and have not always turned out profitable to the Government, although worked as a monopoly.

Between 1830 and 1861 there were no fisheries, and since 1805 there have been only thirteen, the shells selling for about 25 lacs of Rupees.

For several years before a fishery takes place the oyster beds are carefully watched and guarded by the Superintendent and his subordinates.

At regular intervals a few hundred oysters are taken up and opened, to see to what size the pearls are grown. It often happens that the Superintendent visits a bank that was found well stocked on a former inspection and draws a blank, the oysters having all

disappeared. This is due to the water having become brackish owing to the floods in the rivers, or to their having been attacked and driven away by star fish to form new beds.

While the beds are maturing they are watched day and night. A special guard boat patrols the banks, and visits them all daily.

The Government steamer used by the Superintendent is appropriately called the "Margarita."

All the fishing boats on the coast near the banks are shadowed by a Government canoe, to see that the fishermen do not fish on the banks, and also to prevent them from anchoring there. These boats use large stones for anchors which, when dropped on the beds, crush the shells.

Experience has proved that oysters hate to be disturbed, and when this is frequently done they migrate elsewhere to more favourable situations. Perhaps the local impurities caused by the dead ones have something to do with this desire for a quiet life.

When there is a good prospect of a fishery, the Superintendent visits all the banks with his divers and staff, and a few thousand shells are taken up from the different banks to be opened and examined.

If the pearls are found by the appraisers to be sufficiently valuable, a fishery is publicly announced, and advertised all over India.

Great crowds of people assemble on the shore on the day appointed, a huge camp is constructed, and every precaution is taken to make it clean and sanitary.

Traders come from all parts of India, Ceylon, Burma, Arabia, and Africa to buy the oysters and to sell their wares.

The Collector of the district and one or more of his assistants are in charge of the camp, while the Superintendent is in charge of the fishery arrangements. A temporary treasury is erected, and the interests of law and order in the camp are safeguarded by a posse of policemen. There are also hospitals, markets, etc., in fact everything necessary for a huge camp.

The pearl divers are trained for their work from boyhood by diving for chank shells, also worked as a Government monopoly, and peculiar to the Tinnevely District.

The divers do not ordinarily remain a full minute under the water. Even the most expert cannot remain down longer than 90 seconds, or work at a greater depth than 13 or 14 fathoms.

Most of the Indian banks are in 9 to 12 fathoms of water, whereas those in Ceylon waters are in 4 to 6 fathoms only, consequently the Ceylon Government finds it less difficult to get divers for the work.

An understanding has now been arrived at between the two Governments, so that their respective fisheries do not clash.

When a boat containing the divers reaches the oyster bed, the men jump into the water, each with a stone weighing from 30 to 40 pounds tied to his feet, to make him sink rapidly. He is furnished with a net, tied round his waist, to hold the oyster shells, and a rope is made fast round his body, the other end of which is rove through a block on the boat, and held by one of his comrades on board.

On reaching the bottom the diver fills his net with the shells as quickly as possible, using his feet for the purpose as dexterously as his hands, until his breath fails, when he tugs at his rope, and his friends in the boat pull him up, leaving the stone below, which is recovered by a separate line attached to it.

Sometimes the divers come up with blood flowing from their mouths, nostrils, or ears.

The only respite they have is while one of their companions makes the descent. The work tells very much on them, and they are in consequence very short-lived.

No artificial appliances of any kind are used to enable the men to stay under the water for longer periods.

When the boats are full they are sent ashore, and the oysters are piled in heaps of a thousand each, to be sold by public auction.

When the first thousand is being sampled there is tremendous excitement amongst the buyers, and if the yield of pearls is large the following heaps are bound to be knocked down at fancy prices.

The oysters are left to rot on the ground for 2 or 3 days, when they open of themselves, and the pearls are then extracted and carefully washed.

The pearls are small, round or oval concretions of bright translucent whiteness, found on the inside of the shell. The most appreciated colour is a silver-like brightness, and with this quality the largest is naturally the most valuable. The shape most prized is round, but in many cases the largest pearls are pear shaped. Seed pearls are of the smallest size.

The pearl oyster does not belong to the same family as the edible oyster, and forms no part of the food of the natives.

It resembles the mussel tribe, more particularly as it has a byssus, or cable as it were, by which it attaches itself to foreign substances or others of its own kind.

It has no eyes, but about an inch and a quarter from the shell it has a pair of gills.

It is not a great eater for its stomach is very small. Its food is made up of certain minute weeds, animalculæ and shells called foraminifera.

The native divers assert that there are male and female oysters, the large flat ones they say are the males, and those that are thick, concave and vaulted they hold to be females.

They are highly tenacious of life in deep water, but cannot live in shallow or brackish water.

The byssus cannot be detached from any substance to which it is once caught, but it can be cast off from the shell and a new one formed at will. The oyster can get on very well for a long time without forming any byssus.

The formation of the pearl is supposed by many to be due to an accretion within the shell of the superabundant matter called nacre, or mother of pearl, with which the inside of the shell is coated; while others again consider it a disease of the fish. Pliny and Deoscorides believed that pearls were produced by dew, a theory that found no favour with Sir Richard Hawkins, the observant old navigator of Queen Elizabeth's time who remarked that "this must be some old philosopher's conceit, for it cannot be made probable how the dew should come into the oyster."

The natives of India still believe that pearls are produced by the oyster drinking in drops of rain, and that these and many precious stones cannot be produced without rain. There is a Tamil proverb which says "A rain drop that falls on any oyster becomes a pearl, so a benefit conferred on the virtuous will endure."

On the Coromandel coast the natives will tell you that pearls can also be found in bamboos, sugarcane stalks and elephants' tusks. After this we are prepared for any amount of extraordinary things and are not surprised to hear that the Hakim, or native doctor, uses the powder of pearls for many ailments, especially hæmorrhage, weak eyes and all nervous diseases. The natives believe that when

applied externally while in its embryo stage the pearl will cure leprosy.

The chank shells have been from time immemorial one of the commercial products of the Gulf of Mavaar.

The word chank is probably derived from the Sanserit word "shan," to soothe, perhaps from the effect which the shell is popularly believed to produce when held to the ear.

The chank, also known as the shank and the conch shell, is a fairly large convolute shell, generally from 5 to 6 inches long and from 1 to 3 inches broad.

By the naturalists it is classed as the *Turbinella rapa*, a species of the Genus *Turbinella*, of the gastropodous molluscs of the Muricidæ family.

According as the shells have short or pointed heads they are classed by the fishermen as "patty" or "pajel."

A rare kind, somewhat of a freak of nature, with the whorls from right to left instead of left to right, as in ordinary shells, is known as "Vallambory." Large quantities of these chanks are fished up by divers every year from the muddy bottom of the sea off the south coast of India.

They are found in the vicinity of the pearl banks, either buried in the sand, lying on the bottom, or in sandy crevices between the coral. They are, however, more scattered than the pearl oyster, so that the divers have to move about from place to place to find them. As they are generally found at a depth of from 2 to 10 fathoms of water the work of diving for them serves as an apprenticeship for the more exhausting work of pearl fishing.

The divers carry a bag or net round their hips, into which they put the shells they find while groping on the bottom. Twenty shells are considered a good haul for one plunge.

The fishery is always more or less successful, as the chanks, unlike the pearl oysters, are generally found in great quantities, so that the success of the fishery depends upon the zeal and activity of the Superintendent, the divers, and his subordinates, and in great measure on the state of the market at the time they are sold.

The season begins in October, and generally closes about the end of May or the beginning of June, being practically suspended only during the south-west monsoon. As a rule the actual fishing takes place only on about 150 days in the year, partly because the banks are

such a long way from the shore, and partly because the divers are indolent and lazy. Matters would be mended considerably if a small tugboat were provided to tug the boats from the depôt to the fishing banks and back again, as very much valuable time is lost going to and from a distance of often more than 14 miles.

It is a great pity that the chank fishery is not fostered and cared for more than it is, for the trade in the shells is not only of extreme antiquity, but is still exceedingly profitable, and is a certain and steady source of income to the Government, whereas the pearl fishery is very often a loss, but there is, and always will be, a certain charm, a feeling of sentiment, to say nothing of the gamble, about the pearl fishery, which is altogether lacking in the uninteresting but much more profitable and useful chank fishery.

The fisheries are principally round the coast of Ceylon, at Kelikarai, in the territory of the Rajah of Ramnad, and at Tuticorin, in the Tinnevely District.

Like the pearl fisheries, they are a Government monopoly, under the management of the Port Officer of Tuticorin, who is responsible to the Madras Government for their efficient working. The divers go out in canoes for which Government pays a monthly rental, and in some cases they are provided by Government with boats, ropes, and other necessary apparatus.

At the close of each day's fishing the shells are brought on shore to the godown, where they are examined and passed through a wooden gauge $2\frac{1}{2}$ inches in diameter. All the shells that pass through are rejected and put back into the sea. Wormed and dead shells are likewise rejected, and only those green or live chanks which are too large to pass through the gauge are paid for and stored in the godown.

The usual rate of payment is 20 Rupees per thousand.

The mollusc is then left to rot for many weeks, during which time it is not pleasant to approach the building from leeward as the stench is awful, and the place swarming with flies and other objectionable insects.

In July or August the shells are sold by tender, and command from 60 to 80 Rupees a thousand, according to the state of the market; wormed and dead shells find buyers at from 6 to 10 Rupees a thousand. Those that are much above the average size fetch prices in proportion to their size. Some have become famous and have sold

at fabulous prices. Specimens of the Vallambory chank for instance have been sometimes priced at a lac of rupees. They are held in such reverence and esteem that formerly it was quite an ordinary thing for such specimens to be sold for their weight in gold, but nowadays they can be obtained for 50 to 100 Rupees each.

Most of the shells find their way to the Calcutta market from whence they are exported all over the world.

They are also sold to native workmen in Calcutta and elsewhere who saw them into narrow rings to be used as bangles, anklets and beads. Not a few of them are used on saddlery and harness, and they may often be seen suspended from the foreheads and round the necks of carriage bullocks and jutka ponies. The carving of shell churi or bracelets is one of the indigenous arts of Bengal. The Sankasari of Dacca are known all over India for the excellence of their work. Rings of chank shells are in high favor as ornaments among the Hindu fair, who load their wrists, ankles and fingers with them.

In the Ethnological Court of the Museum at Calcutta, a series of specimens of ornaments made from these shells are shown as worn by Kake, Metha and Butia women.

A superstition, or perhaps in reality a belief, founded on the glamour baubles have for the Indian fair sex, formerly prevailed in Bengal anent these chank ornaments, by which it was held no maiden in honor or esteem could be corrupted save by decking her arms with bangles of chank shells. Not only are they used to enhance the charms of the living, but they are credited also with benefiting the dead, and it is customary to bury large quantities of the shells with the bodies of persons of wealth and position.

Great quantities are exported to Europe, America and the Colonies for the manufacture of buttons and studs.

In the religious life of the people of India they play no unimportant part.

In Hindu and Buddhist temples they are used as lamps and also for pouring water on the gods, but this latter kind belongs to the species known to naturalists as *Muzzarappa*. Perhaps it is due to this use of the shell that we have the Tamil proverb which says "If poured into a chank shell water is sacred; if into a chatty it is what it is," another way of saying that things depend upon circumstances. Religious mendicants, especially those of the Veeran Roosty Sect,

convert them into horns by boring a hole through the base. When blown these horns give a loud, sharp, piercing sound. They are used in the Hindu temples for the two-fold purpose of calling the people to worship and calling the attention of the gods to the worshippers. With this triton music the Brahmin wakes the gods in the morning and lets the world know when he dines. In the martial life of the people the chank, or war shell, pealed the blast that sounded the onslaught in battle.

Readers of the martial poetry of the Rajputs will have noticed the frequent allusions to the "blast of the shell" which played the same part as the brazen trump of western chivalry.

In the great civil war between the Pandu and their kinsmen, the Keiru, as described in the Mahabarata, Krishna used the famous shell Panchagannia. Each chief also sounded a shell to which like Excalivar, Flamberge, Balmung, and other famous swords of European renown, distinct and significant names were given.

Vishnu's shell was known as Darendram, and if you examine the pictures and figures of the god carefully you will notice that he carries his chank shell in one hand, and a wheel or discus in the other.

It also appears as a symbol on some of the coins of the Pandyan Kingdom of Southern India, and it is still to be seen in the modern coins, stamps and flags of the Maharajah of Travancore, and when the Chalukya dynasty ruled in the upper Camatic the chank served also as the insignia of royalty with its rulers.

CHAPTER III.

Ceylon Ports.

The history of **Ceylon** is extremely interesting and is briefly as follows.

It may be divided into two parts, viz., ancient and modern, and the latter again into three periods, Portuguese, Dutch, and British.

The most famous of the many ancient Sinhalese books is the *Mahavansa*, which is written in the Pali language, and extending from the earliest period until 1756 A.D.

It has been proved beyond doubt that Wijaya, an Indian Prince from Bengal, landed, probably at the mouth of the Kirindeganga River on the south-east of the Island, and with his army subdued the aboriginals, and founded a dynasty that lasted for nearly eight centuries.

- According to tradition Buddha traversed the Island, and left his footprint on Adam's Peak. He is said to have died 543 years B.C. Buddhism was established as the national religion of Ceylon 307 B.C., and the great Bo tree was planted by King Devenipatiassa 288 B.C.

Many stupendous and beautiful buildings were erected during the next 200 years, the ruins of which are still in existence, and in the north of the Island many wonderful relics have been discovered, that had been buried for ages in the depths of the forest.

In 237 B.C., the throne was usurped by the foreigners from Coromandel, who had been paid by the native kings to defend the Island. They invaded the country from time to time, with more or less success, until 1071 A.D., when the native dynasty was again established.

During the reign of Prakrama, which commenced in 1153 A.D., no less than 1470 tanks were constructed, and canals dug to connect them. The canal was known as the Sea of Prakrama.

Thirty years after his death the Island was again invaded by Tamils, who conquered the whole Island.

In 1235 A.D., however, part of the kingdom was recovered by the native dynasty. In 1398 the king was taken captive by the Chinese.

Europeans first appear on the scene in 1505, during the reign of Dharmma Parakramabru IX. The Portuguese met with a friendly reception, and were permitted to trade. A fort was built to protect their factory by Lopez Suarez Albergaria, in 1518, at Colombo. Their mission was according to their own account one of peace and commerce, but in reality they were most cruel and overbearing, and the natives, exasperated by their treatment, invested the fort with 20,000 men, and kept it besieged for seven months. The fort was eventually destroyed by order of the King of Portugal in 1524.

The whole Island was bequeathed to the crown of Portugal in 1580.

Ralph Fitch, an English merchant, visited Colombo in 1589, and the first English ship visited Galle in 1592.

The Dutch came to the Island in 1600, and the admiral made overtures of friendship and protection to the Sinhalese King, on behalf of the Prince of Orange, which were accepted, but the admiral was killed, together with many of his attendants, three years later.

The Dutch and Portuguese were continually at war from 1612 to 1656, during which time the latter gradually lost both their power and possessions, and were finally driven out of the Island on the 12th May, 1656.

The Dutch appear to have been more or less successful in their dealings with the natives, and governed the low country wisely and well, making many converts and building many churches. In 1749 the New Testament was published in Tamil by the Dutch Government. Ceylon has ever been a great field of missionary labour, with many great and good results. The various Protestant Missions in the Northern Provinces, especially amongst the Tamil population, having been most successful.

The Dutch were, however, during the whole of their occupation, at variance with the Kandyan Kings, and it was not until 1765 that a peace was concluded, giving the Dutch unmolested possession of all the places on the coast.

A British squadron, under the command of Sir Edward Hughes, and some land forces, under Sir Hector Munro, took possession of Trincomalee on the 11th January, 1782, but it was taken from us by the French fleet, under Suffrein, on the 31st August of the same year, and restored to the Dutch.

It was during the great European war succeeding the French Revolution that the English gained possession of Ceylon.

General Stewart captured Trincomalee, after a siege which lasted three weeks, on 26th August, 1795, and Jaffna and Kalpitiya surrendered to the British Forces at the latter end of the same year.

In 1796 a preliminary treaty was concluded between the Governor of Madras and the King of Kandy, and Colombo was surrendered to the British by capitulation on the 16th February in the same year, and maritime Ceylon was governed from Madras for two years, when it was made a Crown Colony in October 1798. Maritime Ceylon was definitely ceded to the British by the treaty of Amiens in 1802. The native sovereigns, however, still retained their mountain territory, and in 1802 serious aggressions were made on British subjects, and the Kandyan King seized and murdered many merchants trading to Kandy. War followed and the British troops entered Kandy on the 21st February, 1803.

In June the same year the Kandyan attacked the British garrison and cruelly murdered all our troops. Major Davies' life was spared but he was kept in captivity at Kandy and died in 1812.

In 1805 the natives invaded British territory, but were repulsed with great loss by the troops under Captain Pollock at Hanwella.

Ten years later, war was declared against the King of Kandy, on account of his cruelty to his own subjects, as well as to all British subjects that entered his territory, and the Sinhalese's independence was finally crushed in that year, after having lasted over two thousand years.

In consequence of several small outbreaks on the part of the Kandyan chiefs in the Uva district, their territory was put under martial law in 1818, and two years later the whole country appears to have settled down under British rule.

From that time the history of Ceylon has been one long narrative of prosperity. Her cities have grown and her ports flourished, until she has become the richest, greatest, and happiest of all His Majesty's Crown Colonies.

These remarks have been condensed from Mr. John Ferguson's various works on the Island of Ceylon.

Jaffnapatam. When the Dutch were the rulers of Ceylon the northern province appears to have been their choicest possession, and the one on which they bestowed the most care and attention, traces of which may be seen in the neighbourhood, in the beautiful old churches, dating from the middle of the last century, many of which are still in excellent preservation.

There is a curious old Dutch church within the fort at Jaffna, and there are several quaint old Dutch houses in the town, which is itself a picture of cleanliness. The prosperity of the town may be traced to the missionaries, who have been most successful in their work, especially amongst the Tamil population.

It is a regular port of call for the British India and Ceylon Steamship Companies, and is of considerable importance, and many native vessels trade here in the *N.E.* monsoon.

The best anchorage for deep draught vessels is in $4\frac{1}{2}$ fathoms, $1\frac{1}{2}$ miles south of the *S.E.* point of Mandi Tivo.

Anchorage for small steamers will be found in 16 to 18 feet, with Calmoene Point, bearing *E.* magnetic, and the fort church *N.* by *W.* magnetic.

A white stone beacon, 30 feet high, has been erected on the *S.E.* end of Delft Island. Similar beacons have been erected on the *S.E.* coast of Pungre Tivo on Calmoene Point, and on the *N.* coast of Paale Tivo.

An obelisk, from which it is proposed to exhibit a green light, has been erected on the west side of the southern entrance to the boat channel leading to the town, in Latitude $9^{\circ} 37' 40''$ *N.*, Longitude $80^{\circ} 0' 10''$ *E.*

A fixed red light is shown at Kovilam on the *N.W.* point of Karativu, Latitude $9^{\circ} 45' 45''$ *N.*, $79^{\circ} 51' 45''$ *E.* It is exhibited from a white steel mast at 60 feet above high water, and is visible 6 to 8 miles in clear weather.

Kangasanturai is a port of some importance, carrying on considerable trade with the ports in Southern India, and is also a regular port of call for the British India and Ceylon Steamship Companies.

The best anchorage is close to the beach, with the Lighthouse bearing *S.* 16° *E.* magnetic.

The Light, in Latitude $9^{\circ} 50' N.$, Longitude $80^{\circ} 01' E.$, is situated near the western bastion, and is a fixed, green, dioptric light of the 5th order, standing 75 feet above high water level, and visible in clear weather 14 miles.

The Light is visible from *N.* $89^{\circ} E.$ through *S.* to the coast on the eastern side, except where obscured by Palmyra Point.

There is some foul ground diverging from the beach to the westward of Kangasanthurai, which extends two miles from the shore, a little further west, and should be avoided when coasting to Jaffnapatam.

The channel between the main and the foul ground off the middle banks is about 6 miles wide, with from 5 to 8 fathoms of water.

When the opening between Amsterdam Island and the main bears *S.* the foul ground is passed.

There is good anchorage $\frac{1}{2}$ a mile outside any of the islands.

Keep close in round all the small islands after passing Kayts, in about 4 to $4\frac{1}{2}$ fathoms, till within 2 miles of Delft Island, which will be seen ahead, then keep to the eastward and close in round Poongretevo, taking care not to haul to the *N.* of *E.* until that island is 4 miles astern.

For steamers leaving Kangasanthurai for Ceylon ports, the best channel is inside the Point Pedro shoals, keeping about $\frac{3}{4}$ of a mile from the shore on the mainland, in about 6 to 7 fathoms.

Point Pedro may be known by the buildings on the beach about a mile to the westward of it,

A red, fixed, 5th order dioptric light, elevated 60 feet above high water, and visible 7 miles in clear weather, is exhibited from a white steel mast, *S.E.* of the point in Latitude $9^{\circ} 49' 30'' N.$, Longitude $80^{\circ} 15' E.$

Ethiopia Shoal, on which the B.I. steamer of that name touched, has 12 feet on it; from it Point Pedro bears *N.W.* $\frac{3}{4} W.$ magnetic, $12\frac{1}{4}$ miles and Kudaripu (on the main abreast) *W.* by *S.* $\frac{1}{4} S.$ 4 miles nearly.

An obelisk, 50 feet high, and painted white, in Latitude $9^{\circ} 33' 45'' N.$, 22 miles *S.E.* of Point Pedro, when bearing *W.* by *S.* $\frac{1}{4} S.$, leads southward of the *S.* end of Pedro shoals, in 7 fathoms of water.

The Mullaitivu Shoals stretch nearly 6 miles from the coast, and occupy a space nearly 9 miles in extent.

The beacon, a circular tower with a dome top, 79 feet high, painted white, and constructed of iron framework and timber, is situated on the south bank, northward of Mullaitivu.

Mullaitivu Light, in Latitude $9^{\circ} 17' N.$, Longitude $80^{\circ} 48' E.$, is situated near the mouth of Vattuvahal Aru, and is a fixed, white, dioptric light of the 5th order, illuminating an arc of 360° , standing 77 feet above high water level, and is visible 12 miles in clear weather.

Approaching Trincomalee from the northward, Elizabeth Point should not be passed closer than 1 mile off, as there is foul ground extending some way to the eastward.

From the southward, Foul Point should not be approached closer than 2 miles from the eastward. Steer for Round Island when it bears *W.S.W.* Pass midway between Round and Elephant Islands, and when Round Island Lighthouse bears *S.* by *E.* proceed up the channel to Ostenberg Point, keeping the Lighthouse on Round Island on a *S.* by *E.* bearing astern.

From the northward steer for Foul Island Lighthouse, when it bears *S.*, and keep on that bearing till Round Island Lighthouse bears *S.W.* by *W.*, then proceed as before.

Trincomalee belonged to the Portuguese from early in the 16th until the middle of the 17th century. They were followed by the Dutch, who retained it for about 130 years. It was taken by the English first in 1782, but they were obliged to surrender it to the French a few months later, who restored it to the Dutch. It was finally captured by us again in 1795, during the great European war, since which time it has been our principal naval station in the East Indies.

The invaders from the Coromandel built a most wonderful temple here, called "the temple of a thousand columns," to which pilgrims flocked from all parts of India.

This celebrated shrine was destroyed by the Portuguese, in 1662, to their everlasting disgrace, and the forts were built with the materials.

The site is still held in great veneration by the Hindus, and once a year a festival is held at the spot where the rock overhangs the ocean.

Trincomalee is in Latitude $8^{\circ} 33' 30'' N.$, Longitude $81^{\circ} 13' 10'' E.$, and possesses a considerable trade, and it is a regular port of call for the British India and Ceylon Steamship Companies.

There is a large anchorage, varying in depth from 7 to 15 fathoms, and the deepest vessels can enter at all states of the tide. The largest vessels can lay alongside the Naval Yard sea wall; the merchant vessels' anchorage is less than half a mile from the wharf in 4 to 8 fathoms of water.

The channels leading to the anchorage are all buoyed.

1. Elephant rock buoy is painted white.

Minden rock buoy is also white; the channel to Trincomalee harbour lies between these 2 buoys.

3. The submarine mine field is marked by a red buoy, surmounted by a red flag, and has the words "Torpedo Buoy" written on it.

4. Two white buoys mark a small shoal lying *N.W.* of the Naval Yard Flagstaff.

5. A chequered black and white buoy marks the western extremity of York Shoal. It lies in 23 feet of water, with the Admiral's Flagstaff *N.E.* by *E.* $\frac{1}{2}$ *E.* magnetic, and Round Island Lighthouse just open of Ostenberg Point bearing *S.* $\frac{3}{4}$ *E.* magnetic.

There is no proper channel between this buoy and York Island.

A conical white buoy marks the "Kerbela" rock on which the B.I. steamer of that name struck. There is only 15 feet of water over it.

7. A white buoy has been placed on the *N.* side of Grommet Rock.

Pilotage is compulsory; the pilots are usually to be found close to Round Island. The charges are Rupees 15 in and out. For tonnage and port dues see **Colombo**.

It is high water, full and change of the moon, at 9 hours 23 minutes; springs rise 2 feet, neaps $1\frac{1}{2}$ feet.

The principal exports are tea, cinchona, cinnamon, plumbago, deer horns and skins, etc., valued at 40,000 Rupees.

The principal imports are spirits, millinery, general merchandise, and naval stores and machinery, valued at 400,000 Rupees.

There are sufficient boats and men for the requirements of the port.

There is a crane at the jetty capable of lifting about 3 tons.

Supplies of all sorts can be procured. Coals can be had in any quantity.

Small repairs can be executed at the Naval Yard.

The Admiralty contemplate building graving docks for the Imperial Navy.

Round Island Light, in Latitude $8^{\circ} 31' N.$, Longitude $81^{\circ} 14' E.$, is situated on the summit of Round Island, and is a fixed, white, dioptric light of the 4th order, standing 103 feet above high water level, and visible in clear weather 13 miles.

Foul Point Light, in Latitude $8^{\circ} 32' N.$ Longitude $81^{\circ} 19' E.$ is situated on the extreme point, and is a fixed and flashing, white, dioptric light of the 2nd order, standing 104 feet above high water level, and visible 16 miles in clear weather from all directions seaward. It shows a flash every half minute; the faint light between the flashes is not visible beyond 10 miles.

A red light is also shown occasionally from the Naval Yard, during the presence of a man-of-war, and a red light is shown from the end of the pier when a colonial steam vessel is expected.

Munayai Paru, consisting of large boulders, is nearly a cable in length, with 16 feet over it, and 8 fathoms close to. From the shoal, Foul Point Lighthouse bears *S.S.W. $\frac{3}{8}$ E.*, distant 1 mile.

A flagstaff, 170 feet high, is situated in Fort Frederick, on Flagstaff Point.

The principal landmarks between Trincomalee and Batticaloa are Tower Hill, Baron's Cap, which has the appearance of a sugar loaf, on a *W.* by *N.* bearing, and Gunner's Quoin, a large wedge-shaped hill, and a very useful landmark.

From Foul Point to Clarke Point vessels should not approach closer than the 10 fathom line of soundings.

Batticaloa is an early Tamil settlement, and was known as "Matticaloa" (from "mada-kalappa"), "the muddy lake."

The present fort was built by the Dutch, who took Batticaloa from the Portuguese in 1638. It is still in good preservation.

The principal industry of the town is cotton spinning and weaving, and the cloths are still very popular amongst the natives.

The lake is celebrated for its singing fish.

On the extreme of Vendelus Point there is a dome-shaped beacon, surmounted by a ball painted white.

There are also two masonry beacons, 60 feet high, the front one is painted white, and the rear one red; these in line bearing *W.* by *N.* lead clear of the rock, situated one mile South of Vendelus Point.

Batticaloa is the principal port in this part of Ceylon. The port is used by native craft in the *S.W.* monsoon, and the Ceylon Company's steamer calls here at regular intervals.

The Light, in Latitude $7^{\circ} 45' N.$, Longitude $81^{\circ} 41' E.$, is situated on the mainland at the watch-house, near the bar entrance. It is a fixed, white dioptric light, visible 12 miles in clear weather from seaward from North to South. It is exhibited from the flagstaff at 50 feet above high-water level.

Pilots can be obtained, if necessary.

Close to the beach, and about $\frac{3}{4}$ of a mile from the signalling station, in a *N.W.* by *W.* direction, there is an obelisk painted white, 25 feet high, marking the dangerous ground.

The best anchorage is with the signal-staff bearing *S. by E.* in $6\frac{1}{2}$ fathoms.

Beacon Rock is marked by a black buoy, bearing *N.E.* by *E.* $\frac{1}{4}$ *E.* $1\frac{1}{2}$ miles from flagstaff.

Surveyor Rock is marked by a red buoy, the *N.E.* patch lies *N.E.* $\frac{3}{4}$ *N.* $\frac{1}{4}$ of a mile from the obelisk, and *N. $\frac{3}{4}$ W.* $\frac{9}{10}$ of a mile from the flagstaff.

Steamers wishing to enter the roadstead should steer with the obelisk bearing *S.W.*, until the signal staff bears *S. by E.*, and then anchor, but it is advisable to get a pilot, as they are acquainted with all the dangers and marks; the usual signal will bring them off.

The principal landmarks between Batticaloa and the Little Basses are Friars' Hood, which is unmistakable, and Westminster Abbey, also an excellent mark, the so-called tower being at the *N.W.* end, 1830 feet high.

False Head, Saddle Hill, and Aganis Peak are also excellent land marks.

These interior mountain-peaks are now all correctly marked on the latest charts, and can be relied on for purposes of navigation.

The currents between Basses Rock and Trincomalee cannot be depended upon, and although most careful observations have been taken, no rules could be deduced from the facts obtained, as the direction often changed from North to South and back again without any apparent reason.

Little Basses Light, in Latitude $6^{\circ} 25' N.$, Longitude $81^{\circ} 44' E.$, is situated on the centre of the Little Basses reef. It is a

group occulting, flashing, white dioptric light of the 1st order, standing 110 feet above high water level, and is visible 16 miles in clear weather. It shows a flash of 7 seconds, eclipse 8 seconds, flash 7 seconds, eclipse 38 seconds. The column is built of granite.

The lantern has a domed roof, and there are two galleries at the top of the tower 12 feet apart.

It may be distinguished from the Great Basses, which has a conical roof and only one gallery near the lantern, the other being 30 feet from the base of the tower.

Great Basses Light, in Latitude $6^{\circ} 11' N.$, Longitude $81^{\circ} 29' E.$, is situated on the *N.E.* rock and is a revolving, red dioptric light of the 1st order, which obtains its greatest brilliancy every 45 seconds. It stands 110 feet above high water level and can be seen 16 miles in clear weather. The column is built of granite. The lantern has a conical roof with one gallery under the lantern, and another 30 feet from the base.

The Tamil name for the Basses is "Iramappatham," or "foot of the God."

They are the Bassæ of Ptolomy's map of Taprobane, and are believed to be the remnants of a great island.

Mahavansa states that the early inhabitants of Ceylon were Yacshas deported by Buddha to two beautiful islands, probably meaning the Basses before their submersion.

The Basses and Minicoy Light Dues rates will be found at the end of the book.

There is a channel inside the Great Basses, which is sometimes used by steamers, but there is not much to be gained, and a steamer going to the *N.E.* must haul out well to the eastward to clear the Little Basses.

The coast from the Great Basses to Galle may be approached with safety to within 2 miles.

The B. I. and Ceylon Company's small coasting steamers call at **Hambantotti** twice a month.

The best anchorage is with the Hambantotti tower bearing *S.W.* by *W.* $\frac{1}{4} W.$, and the eastern extreme of the point *S.S.W.* $\frac{1}{4} W.$ in 5 fathoms; all the dangers in the bay are above water.

Rattana Point may be known by its red cliffs of moderate height.

On **Tangalle Point** there is a square fort and cutcherry on the summit of the hill, by which it may be distinguished from seaward.

About a mile northward of Nilewelli, and half a mile inland, there is a conspicuous white pagoda.

Dondra Head is the southernmost point of Ceylon. A reef, with 3 to 5 fathoms on it, on which the sea sometimes breaks, extends $\frac{3}{4}$ of a mile from the western extreme of the head, in a *W. by S.* direction, and the Rajapolila Rocks lie $\frac{1}{2}$ a mile from the head.

The Light, in Latitude $5^{\circ} 55' N.$, Longitude $80^{\circ} 35' E.$, is situated on the eastern extremity, and is a flashing, white, dioptric light of the 1st order, standing 150 feet above high water level, and visible 18 miles in clear weather. It shows a quick flash every 20 seconds. The Lighthouse is an octagonal tower painted white.

A high white obelisk stands near the beach at Matura.

Point De Galle harbour is formed between the point of that name and the sloping land eastward, on the summit of which, 264 feet high, stands Edward's Pillar, about 50 feet high.

The best landmarks inland in this vicinity are Adam's Peak and the Haycock. The cocoanut tree on Pigeon Island, and used as a landmark, having disappeared, has been erased from the charts.

Steamers wishing to enter the harbour should on no account attempt to enter without a pilot, or come nearer the shore than $\frac{1}{4}$ of a mile outside the Bell Buoy, which is moored about $\frac{1}{2}$ a cable *S.E.* of outer Kadda Rocks. The pilot canoe will usually be found waiting here, if the usual signal for a pilot has been made, carrying a flag (white, red, white, horizontal).

A vessel waiting for orders may anchor in the *N.E.* monsoon in 16 fathoms, with the Pilot Tree and Lighthouse in one, and the rocks off Unawatti Point and Erminia Galle in one. There is no safe anchorage outside in the *S.W.* monsoon.

The inner anchorage is on the west side of the harbour, abreast the fort, in 4 to 6 fathoms, sandy bottom.

A detailed description of all the numerous rocks in Galle harbour will not be given here, they can be ascertained from the chart, and as it is absolutely necessary to take a pilot, shipmasters are not required to be acquainted with them. The channels are all properly buoyed.

On the western side of the channel there are two black buoys, moored to the eastward of Polkatti and Bellikatua Rocks, and two to the eastward of Kapera and Vellikoko Rocks.

On the eastern side of the channel a buoy, painted black and white in vertical stripes, is moored *S.W.* of Deumba Dava Rock, and two red buoys are moored westward of Matamada and Kata Rocks.

The wreck of the "Clan Mackay" lies near Katembera Rock.

The following buoys are moored outside the harbour, but too much reliance must not be placed on them as they are liable to break adrift:—

- (1) A conical red buoy is moored $\frac{3}{10}$ of a mile *S.S.W.* from Whale Rock.
- (2) An iron nun buoy, painted red, and surmounted by a flag, lies in 11 fathoms, $\frac{1}{2}$ of a mile south of Gindura Rock.
- (3) The Bell Buoy already mentioned.

By bringing the Lighthouse to bear *E.* by *N.*, a steamer will pass clear to the southward of Gindura and the Whale Rocks.

Pilotage is compulsory, and all vessels entering or leaving pay according to the following scale:—

| Inwards or Outwards. | |
|----------------------|-------------|
| 100 tons | 7½ Rupees. |
| 100 to 200 ,, | 11¼ ,, |
| 200 ,, 400 ,, | 15 ,, |
| 400 ,, 600 ,, | 22½ ,, |
| 600 and upwards | 30 ,, |

Pilots detained on board longer than 48 hours are entitled to claim 4 Rupees for every day's detention after that time.

Vessels are moored head and stern, and hawsers can be obtained for stern moorings from the marine authorities.

It is high water full and change of the moon, at 2 hours; springs rise about two feet only.

The principal exports are tea, coffee, cinnamon, cocoanut oil, arrowroot, copra, glue, coir, fish, hides, plumbago, pearls, sandalwood, lemon grass oil, and citronella and cinnamon oils, valued at 30,000,000 Rupees.

The imports are principally rice, coal, timber, and European goods and liquors, valued at 43,000,000 Rupees.

It is a regular port of call for the British India and Asiatic Company's steamers, and many other steamers call here for orders or

to load for Europe, and there are large supplies of coal discharged by steamers from Europe and Calcutta.

Galle has also railway communication with Colombo.

Port dues are 8 cents. per registered ton ; mail steamers pay 50 Rupees, and coaling is free of port dues.

The port is under the charge of a Master Attendant. There is also a Collector of Sea Customs.

Fresh water and stores can be supplied in any quantity.

Coals can be obtained and put on board at the rate of 50 tons an hour.

Small repairs can be executed.

European seamen are admitted into the hospital, which is a very good one. No hospital dues on shipping.

The Light, in Latitude $6^{\circ} 01' N.$, Longitude $80^{\circ} 12' E.$, is situated on the *S.W.* bastion of the fort, on the *W.* side of the harbour.

It is a group flashing, white, catoptric light of the 2nd order, and shows a double flash every 30 seconds. Duration of flash 2 seconds, intervening eclipse 3 seconds, standing 100 feet above high water level, and visible in clear weather 15 miles. The light is exhibited from a circular iron tower painted white.

The signal station is on Neptune Battery, $\frac{1}{4}$ of a mile *N.W.* of the Lighthouse.

The Bell Buoy marking Kadda Rock has been moved and is now moored in 12 fathoms in Latitude $6^{\circ} 0' 30'' N.$, Longitude $80^{\circ} 12' 45'' E.$ $2\frac{3}{10}$ cables *S.* $\frac{1}{2}$ *E.* from outer Kadda Rock, with Point de Galle Lighthouse *N.* $17^{\circ} W.$ 9 cables, and the town on Watering Point *N.* $58^{\circ} E.$

Commanders of steam vessels should keep a position clear of the buoy until the pilot shows his flag, when it is safe to steer for the pilot's boat.

If under sail, the boat is distinguished by the letter P on it with the pilot flag.

Should the buoy be out of position the usual signals will be made from the flagstaff.

A Lloyd's signal station has been established in Latitude $6^{\circ} 2' N.$, Longitude $80^{\circ} 12' E.$ at Neptune Basin, to which any vessel requiring to be reported at night should make the night signal of her line.

Vessels passing the harbour at night, and wishing to indicate that they are calling at Colombo, should show a red light aft in addition to the night signal.

Arrangements have also been made at this station for immediate delivery to vessels at night, weather permitting, of orders for them; the charge for doing this being 20 Rupees.

During the day orders will be signalled to vessels on the usual conditions.

The charges for reports from this station are :—

Day time - 10d. each,

Night time - 1s. 3d. each,

in addition to the cost of the telegram.

Amblangoddi, “rest-house,” a conspicuous building from seaward, standing on the summit of a rocky cliff, is half a mile *S.E.* from Gindavana Island.

A large house on the cliff near Cabravanna Rock is also a conspicuous object.

Barberyn Light, in Latitude $6^{\circ} 28' N.$, Longitude $70^{\circ} 58' E.$, is situated on the summit of the island, and is a flashing, white, dioptric light of the 1st order. It shows a slow flash every minute, and stands 150 feet above high water level, and is visible 18 miles in clear weather. The column is a circular granite tower, painted white.

Mount Livinia is a rocky headland, 6 miles south of Colombo. The hotel is a conspicuous building, painted white. The 10 fathom line is less than $\frac{1}{2}$ a mile from the coast here. Between this and Colombo there are numerous houses reaching to Galle face, the open space in front of the fort.

Coasting steamers should keep about 5 miles off the coast between Galle and Colombo; some of the outlying dangers are 8 miles off the coast.

Colombo. The only dangers in the vicinity of Colombo are the Drunken Sailor and the Tartar Rocks.

The former is marked by a black buoy in the *N.E.* monsoon, from October 15th to April 15th, moored half a cable to the westward of the rock.

The latter is marked by a red buoy all the year round, which is moored half a cable to the *N.W.* of the rock.

The Tartar Rock has 21 feet on it, half a mile *N.W.* from the flagstaff.

The Drunken Sailor ledge of rocks with only 7 feet on it, is half a mile from the shore and *W.S.W.* from Colombo Lighthouse.

Coasting steamers should not approach the entrance to the harbour till the Lighthouse, or red light on the end of the breakwater, bears eastward of *N.E.* by *E.*, when the outlying dangers will be passed. From the westward the Lighthouse, or red light, should be brought to bear *E.* by *S.* before approaching the entrance.

The best anchorage outside the breakwater is with Colombo Lighthouse bearing *S.S.E.* $\frac{1}{2}$ *E.* magnetic, and the Lighthouse at the end of the breakwater *E.* by *S.*, in 7 to 8 fathoms, sand and mud, and good holding ground.

Inside the breakwater vessels are moored head and stern in tiers, for which purpose buoys are laid down about one cable apart. There are also swinging moorings for small vessels, and an anchorage ground set apart for the small sailing craft.

During the *S.W.* monsoon vessels are moored with their heads to the westward, and to the northward during the fine weather.

Pilotage is compulsory for all vessels over 200 tons. The signal should be made in good time to avoid delay, and the pilot boat may be distinguished by a Union Jack displayed from a staff. At night time pilots will board steamers when the usual blue light signal is shown. They will take steamers out at any time of the day or night.

When a steamer burns a blue light as a signal for a pilot, another blue light will be shown from the pilot's look-out tower, to signal that he is proceeding at once.

When one red light is shown, it means that he is engaged, but will come as soon as possible.

When three blue lights are shown it means that the weather is too bad for boarding during the night. This, however, seldom happens.

The pilotage charges are as follows :—

For both entering and leaving.

Vessels under 200 tons, if no pilot employed, Free.

| | |
|---------------------------|------------|
| Otherwise | 10 Rupees. |
| 200 to 399 tons | 15 „ |
| 400 „ 599 „ | 20 „ |
| 600 „ 799 „ | 25 „ |
| 800 and upwards | 30 „ |

An extra fee of 15 Rupees is paid for pilot's services between 6 P.M. and 6 A.M. each trip—10 Rupees for the pilot and 5 Rupees to the boat's crew.

Port dues are as follows :—

For a stay not exceeding 96 hours.

| | | | | | | |
|-------|---------------------|---|---|---|---|------------|
| Up to | 50 tons register | . | . | . | . | 2½ Rupees. |
| From | 50 tons to 100 tons | . | . | . | . | 5 „ |
| „ | 100 „ 150 „ | . | . | . | . | 7½ „ |
| „ | 150 „ 200 „ | . | . | . | . | 10 „ |
| „ | 200 „ 300 „ | . | . | . | . | 20 „ |
| „ | 300 „ 400 „ | . | . | . | . | 30 „ |
| „ | 400 „ 500 „ | . | . | . | . | 40 „ |
| „ | 500 „ 700 „ | . | . | . | . | 50 „ |
| „ | 700 „ 900 „ | . | . | . | . | 60 „ |
| „ | 900 „ 1100 „ | . | . | . | . | 70 „ |
| „ | 1100 „ 1300 „ | . | . | . | . | 80 „ |
| „ | 1300 „ 1500 „ | . | . | . | . | 90 „ |
| „ | 1500 „ 1800 „ | . | . | . | . | 100 „ |
| „ | 1800 „ upwards | . | . | . | . | 120 „ |

For a stay between 96 and 288 hours, half rates to be added. Over 288 hours, double rates.

Colombo Light, in Latitude 6° 56' N., Longitude 79° 51' E., is situated in the centre of the fort, on the clock tower. It is a group flashing, white, dioptric light of the 1st order, standing 135 feet above high water level, and visible in clear weather 17 miles.

It shows three flashes in quick succession every 30 seconds, each flash lasting 2 seconds, separated by an eclipse of 3 seconds, and followed by an eclipse of 18 seconds. The light is visible seaward to beaches northward and southward.

From the Lighthouse on the Breakwater Pier Head a red, fixed, dioptric light of the 2nd order is shown, standing 56 feet above high water level, and visible in clear weather 13 miles.

A green light is shown from the end of the new breakwater under construction.

A red occulting light—light 10 seconds, eclipse 5 seconds, is shown from the boat marking the submerged end of the southern end of the N.W. breakwater.

The leading harbour lights are placed as follows :—

The green fixed light is near the harbour face, on the east side of the export jetty.

The red fixed light is 800 feet inland, or to the southward of the green light.

They are visible 3 miles, and are exhibited from masts, 42 and 50 feet respectively above high water level.

The 2 lights kept in one lead up midway between the 2nd and 3rd tier of buoys from the breakwater. They are not visible until the line of the breakwater is passed. There are also three small, green, fixed lights at the landing pier.

For a description of Colombo Harbour Works I cannot do better than quote Mr. John Ferguson, Editor of the *Ceylon Observer*.

“The Dry Docks are under construction.

“On the 8th December, 1875, the foundation stone of the first and principal breakwater for the protection of Colombo Harbour was auspiciously laid by H.R.H. the Prince of Wales.

“By the end of 1884 the S.W. breakwater, 4,150 feet long, with a Lighthouse at its terminus, was completed.

“This at once afforded full protection to Colombo Harbour for 9 months out of 12 in the year, at any rate so far as allowing 24 buoys for first-class ocean-going steamers to be moored under the lee of the breakwater.

“A northern and north-western breakwater are now under construction. These arms are to be 1,000 feet and 2,670 feet in length respectively, and are to cost £527,000, and to be finished in A.D. 1903.

“The foreshore all round the harbour is to be reclaimed, and suitable coal depôts are to be established for the mail, as well as commercial and naval vessels, leaving plenty of room (much required at present) for the import and export trade of the port, for passengers’ jetties, and other requirements of a first-class harbour.

“When these arms are completed, the Colombo harbour will have two openings, the western opening being 800 feet wide, and the northern opening 700 feet wide, and the area enclosed will be 660 acres, affording accommodation for quite a fleet of vessels of all sizes and grades, it being noted that the tendency of these days is for steamers to remain in port as short a time unloading, coaling and loading, as possible, quick despatch being the test of a port’s convenience and good management.

“The total cost of the harbour works will exceed £1,250,000.

“There are now few busier ports than that of Colombo, and, not being properly a terminal port, it is fittingly called the Clapham Junction of mail steamers and passengers for the East and far South.

“Every national flag is from time to time displayed in the harbour, as many as 15 to 20 large ocean-going steamers occasionally arriving in one day. The aggregate inwards and outwards tonnage for Colombo now approximates to 6 million tons per annum.

“One great advantage of Colombo Harbour is the ease and safety of approach at nearly all seasons, during night or day. The Colombo Lighthouse stands 120 feet above sea level, and the light is visible 18 miles.

“Harbour lights will mark the ends of the breakwater arms and openings nearly 13 miles off.

“The average rise and fall of the tide is only 18 inches.

“It was felt all along that without a Graving Dock, Colombo Harbour-works could never be considered complete, and after full consideration and negotiations between the Admiralty, the Colonial Office, the Treasury, and the Government of Ceylon, it has just been decided (a few weeks ago*) that a first-class dock, of the largest size, be constructed at Colombo, on a design by Messrs. Coode, Son and Matthews, 600 feet long, by 62 to 85 feet broad, 23 feet deep, equal to taking in the largest iron-clad atloat, at a cost of £318,000, half of which is to be provided by the colony and half by the Imperial” Treasury.

“The work is to be done by 1903 A.D. Colombo will then possess both the largest artificial harbour and Graving Dock in the world.”

There is splendid accommodation for a large number of vessels of the deepest draft. Many of the largest and finest steamers in the world, belonging to the best English and Foreign Steamship Companies, may be seen here trading to India, Burma, Australia and the Far East. The British India Company have a daily mail service between this port and Tuticorin; it is also a regular port of call for the coasting and home line steamers of that Company. The Asiatic line run here at regular intervals, and many steamers call for coals

* March 23rd, 1897.

and orders, and it is frequently visited by men-of-war of all nations. There is also a considerable trade with small native craft.

The following signals will be made from the pilot station tower in answer to vessel's signals for a pilot at night-time :—

- (1) An electric light showing red and white flashes alternately in quick succession, for a period of one minute, indicates pilot will proceed to vessel making signal immediately.
- (2) A red, fixed light for the same period indicates pilot engaged; will proceed to vessel making signal when disengaged.
- (3) A white, flashing light for a period of about two minutes indicates that a vessel should anchor well out or keep under way until daylight.

There is railway communication with Kandy and Point de Galle, and other parts in the interior, and by telegraph through the Indian system with all parts of the world.

It is high water, full and change of the moon, at 1 hour 50 minutes' springs rise 2 feet only, and neaps a few inches.

The principal exports are coffee, cinnamon, arecanuts, cocoanut oil, coir, plumbago, arrack, tobacco, pearls, cinchona bark, lemon-grass, citronella, and other essential oils, ivory, satin and other woods, etc., valued at 80,000,000 Rupees in 1894.

The imports are principally coal, manufactured goods, machinery, railway material, hardware, rice, specie and bullion, animals, cotton goods, wines and spirits, tobacco, salted fish, sugar, etc., valued at 78,000,000 Rupees in 1894.

The total value of the trade of Ceylon is valued in 1897 at £10,000,000 sterling per annum.

The cargo is landed and shipped by the boats of the Wharf and Warehouse Company, and a number of native companies.

There are sufficient boatmen for the requirements of the port, and labour is abundant and inexpensive.

Landing and shipping cost $12\frac{1}{2}$ cents on all cargo from vessels under 200 tons, and 25 cents a ton for vessels over that tonnage.

Transshipment cargo pays no dues unless entered for duty.

The port is under the charge of a Master Attendant, who has charge of the Pearl Fisheries as well.

There is also a Collector of Customs, a member of the Colonial Civil Service.

Provisions and stores of all kinds can be had in abundance. They are cheap and good. Coals to any amount can be obtained, and put on board at the rate of 100 tons an hour. There are several water-boats and it costs alongside 1 Rupee per 1,000 gallons.

Seamen are admitted into the General Hospital on application. There are no hospital dues on shipping.

Time is obtained daily at 4 p.m. from Madras Observatory by telegraph.

The Flagstaff is in Latitude $6^{\circ} 56' 34''$ N., and Longitude $79^{\circ} 50' 34''$ E.

The signal is a red and white semaphore, inclined at an angle of 45° as preparatory, at 5 minutes before the signal. It is situated at the Port Office in Latitude $6^{\circ} 56' 30''$ N., Longitude $79^{\circ} 50' 30''$ E.

At 2 minutes before the signal it is placed horizontally, and dropped at 4 hours 15 minutes Madras mean time, corresponding to 22 hours, 54 minutes, 0.6 seconds, Greenwich mean time.

A dry dock for the Imperial Navy as well as for commercial purposes is under construction. Temporary repairs have been made to large steamers' hulls in Messrs. Walker and Company's yards very successfully. The Engineering Establishment is capable of effecting all repairs, and boilers can be repaired, and large forgings can be executed.

There are cranes to lift 20 tons, and gear for any weight can be obtained.

Salvage gear is available.

Quarantine is imposed when vessels have contagious or infectious disease on board, or have had within 10 days of arrival. The time of quarantine is decided by the principal Medical Officer. All steamers are boarded on arrival.

Cyclones are unknown in Colombo. The *S.W.* monsoon lasts from the 10th of May to 10th of October. The weather is generally unsettled in the interval between the *S.W.* and *N.E.* monsoons. For the rest of the year the weather is fine, and communication is never interrupted.

It is estimated that 350,000 tons of coal are imported into Colombo annually, and that 30,000 passengers pass through Colombo each year to and from the far East, India and Australasia.

The native passenger traffic between India and Ceylon amounts to 120,000 persons every year, about 80,000 to 90,000 returning annually.

To face page 200.

The Semaphore time signal at the port office in latitude $6^{\circ} 56' 35''$ *N.*, longitude $79^{\circ} 50' 35''$ *E.*, is dropped daily (Sundays and public holidays excepted) at 20 hrs. 15 m. Madras Mean Time (20 hrs. 13 m. 23 secs. local mean time) equivalent to 14 hrs. 54 min. 0.6 secs. Greenwich Mean Time as well as at 4 hrs. 15 m. Madras
• Mean Time.

Rules for the Port of Colombo.

Dues payable on Imports at Colombo.

| | Cts. |
|---|------|
| For each butt, pipe or puncheon for 5 days | 50 |
| Half-pipe or hogshead " | 25 |
| Barrel or quarter-cask " | 15 |
| Cask or keg of smaller size " | 10 |
| Crate, cask or case of hardware, earthenware or ironmongery " | 25 |
| Bale, case or box measuring 60 cubic feet or upwards " | 25 |
| " " " 40 " and under 60 cubic feet " | 20 |
| " " " 25 " " 40 " . " " | 15 |
| " " " 15 " " 25 " . " " | 12 |
| " " " 10 " " 15 " . " " | 8 |
| " " " 5 " " 10 " . " " | 6 |
| Each small box or package " | 4 |
| Bag of rice or sugar " | 4 |
| Beer, wine, or spirits in bottle per dozen quarts " | 4 |
| Coir yarn or rope, in ballot or bundles per cwt. " | 5 |
| Heavy goods, such as metal or timber per ton " | 25 |

Other goods of like size or weight to be charged in proportion to these rates.

These rates to admit of goods remaining at the wharf for a term not exceeding five days of which the day of receipt and the day of removal shall each count as one day. Thereafter an additional similar rate to be charged for each succeeding five days, or part thereof: provided that in the case of goods landed for transshipment and not entered for duty these rates shall not be leviable for the first term of five days herein before defined, but shall be leviable for each succeeding term of five days or part thereof.

Dues payable on Exports at Colombo.

| | Cts. |
|--|------|
| For each leaguer, pipe or cask of like size for 5 days | 25 |
| Hogshead or cask of like size " | 12 |
| Cask or barrel of coffee not weighing more than 3 cwt. gross " | 6 |
| Cask weighing more than 3 cwt. and less than 7 cwt. " | 8 |
| " " 7 cwt. " | 12 |
| Barrel of plumbago " | 7 |
| Each bale, case or package measuring 60 cubic feet and upwards " | 25 |
| " " " 40 " under 60 cubic feet " | 20 |
| " " " 25 " " 40 " " " | 15 |
| " " " 15 " " 25 " " " | 12 |
| " " " 10 " " 15 " " " | 8 |
| " " " 5 " " 10 " " " | 6 |
| Smaller box or package " | 2 |
| Bag of coffee " | 4 |
| Other goods of like size or weight to be charged in proportion to these rates. | |
| Coir goods in ballots or bundles per cwt. " | 4 |

These rates to admit of goods remaining at the wharf for a term not exceeding five days, of which the day of receipt and the day of removal shall each count as one day. Thereafter an additional similar rate to be charged for each succeeding five days or part thereof.

Port Rules.—The following are the Rules relating to the Port of Colombo :—

Commanders of all vessels arriving within the port, or their agents shall report their vessel without delay at the Custom House and Master Attendant's Office and furnish the Master Attendant with a list of their passengers disembarking and embarking, and 12 hours before sailing hoist a Blue Peter at the fore, and give notice at the Master Attendant's Office of the time of sailing.

Commanders of all vessels arriving within the port shall, without delay, deliver to the pilot boat or other boat sent for the purpose, or land in their own boat, all mail packets or letters intended for the port.

All vessels within the port shall take up the berth appointed for them by the Master Attendant, and shall change their berth or remove whenever he requires them to do so.

No vessel within the port shall change her berth or remove without permission from the Master Attendant, except in cases of emergency.

No person shall leave, and no person, except a pilot, shall go on board of any vessel arriving within the port that has not a qualified Medical Officer until the Port Surgeon or Health Officer has given permission to do so.

Any person may leave or go on board of any vessel arriving within the port having a qualified Medical Officer, upon a certificate being given by that officer to the pilot that such vessel is at the time of her arrival free from all contagious or infectious disease, and that she has been free from such during the voyage.

Any vessels arriving within the port liable to be placed in quarantine shall not come within the harbour, but shall cast anchor in the outer roads in the place appointed by the Master Attendant for quarantine anchorage, and any vessel within the harbour placed in quarantine shall immediately be removed to the quarantine anchorage in the outer roads aforesaid.

If any person die on board any vessel within the port, the Commander thereof shall cause the body to be brought on shore and interred or otherwise disposed of under directions of the Port Surgeon.

No person suffering from an infectious disease shall be landed from any vessel within the port without the consent of the Port Surgeon.

No dead animal shall be thrown overboard from any vessel or boat within the harbour or within a radius of one mile from the breakwater head.

No ballast, ashes or rubbish shall be thrown overboard from any vessel or boat within the port under a depth of 12 fathoms water.

All vessels within the harbour shall be moored head and stern as soon as possible after arrival, and shall remain so moored until they are ready to sail.

All vessels within the harbour shall keep their jib and spanker booms rigged in, and shall strike yards and masts, and shall remove any anchor, spar, or any other article projecting from their sides when required to do so by the Master Attendant.

Warps shall be made fast to any vessel within the port, if required, for the purpose of assisting any other vessel in mooring or shifting its berth, and shall be kept fast until required to be let go by the officer in charge of the vessel mooring or shifting.

No vessel or boat shall anchor in the entrance of the harbour or in the channel leading to or from any of the mooring buoys within the harbour.

Free passages shall be kept to all piers, jetties, wharves, or landing places, and all vessels or boats shall move when required to clear such passages.

All vessels taking in or discharging ballast or any particular kind of cargo within the harbour shall take up such berth as may be appointed for the purpose by the Master Attendant.

Tarpaulins properly stretched and spread between the side of the ship and the lighter shall be used by all vessels within the harbour in shipping or discharging ballast or coal, so as to prevent any part thereof from falling overboard.

No loose coal or ballast shall be discharged from any vessel within the harbour in shoots, unless the shoots are constructed not less than 4 feet in breadth, with sides of one foot in depth, and in length sufficient to reach within three feet of a line stretched across the gunwales of the lighter; or in shoots of any other pattern approved by the Master Attendant.

No vessel, boat, raft or any other articles shall be made fast to any buoy, beacon or sea-mark within the port, except buoys intended for the purpose.

No vessel within the harbour shall boil or heat any pitch, tar, resin, dammer, turpentine oil, or any other such combustible matter on board, but may do so when required in a boat alongside.

All vessels within the harbour requiring to be graved, breamed or smoked, shall be moved to a berth set apart for that purpose, by the Master Attendant.

No vessel within the port shall land or ship cargo before 6 A.M. or after 4 P.M. without permission from the Collector of Customs.

No person shall sell, supply or convey any wine or spirituous liquors to any of the crew, or to any other person on board of any vessel within the port without the consent of the Commander of such vessel.

All vessels at anchor within the port shall exhibit between sunset and sunrise, where it can be best seen, but at a height not exceeding 20 feet above the hull, a white light in globular lantern of 8 inches in diameter, and so constructed as to show a clear, uniform, and unbroken light, visible all round the horizon, but at a distance of at least one mile.

No vessel within the port shall fire guns or rockets, or burn blue lights between the hours of sunset and sunrise, excepting the mail steamers on arrival, which may make such signals as may be arranged with the Master Attendant, and vessels in distress, which should make any of the Board of Trade distress signals.

Rates of Agency and Commission as adopted by the Chamber of Commerce.

| | Per Cent. |
|--|-----------|
| On the sale, purchase or shipment of specie or bullion | 1 |
| On the sale or purchase of opium, diamonds, pearls, precious stones and jewelry of all descriptions | 2½ |
| On the sale and purchase of live stock | 5 |
| On the sale or purchase of goods or produce made with the proceeds of goods on which a commission of 5 per cent. has been previously charged | 2½ |
| On the sale or purchase of bank or joint stock shares | 2½ |
| On goods or produce intrusted to an agent for sale or shipment and afterwards withdrawn | 2½ |

| | Per Cent. |
|---|-----------|
| On goods or produce shipped only, or on delivery of the same to order | 2½ |
| On the sale or purchase (including shipment, if required) of all other goods or produce not enumerated above | 5 |
| On sale or purchase of ships, houses or lands | 2½ |
| On guaranteeing sales, bills, bonds, contracts or other engagements | 2½ |
| On procuring money on bottomry and on respondentia | 2½ |
| On the total sum of the debit or credit side of an account at the option of the agent, excepting items on which a commission of 5 per cent. is chargeable | 1 |
| On ship's disbursements | 2½ |
| For procuring freight for U.K. on the amount of freight whether the same passed through the agent's hands or not | 7½ |
| " " " for all other ports | 5 |
| " " " for procuring passengers on the amount of passage money | 5 |
| On collecting freight inward or outward | 5 |
| On executing orders to charter or engage tonnage | 2½ |
| Return commission to shippers on the amount of freight to U. K. | 5 |

(Commission on freight applies to steamers as well as sailing vessels.)

Commissions to agents of steamers, consigned inward from Europe, when the entire cargo is discharged in Colombo to be 50 cents per net register ton, but the charge not to exceed 500 Rupees and on steamers partially discharged 50 cents per ton for every ton discharged, but the charge in no case to be less than 150 Rupees.

| | |
|--|----|
| Commission to agents of steamers consigned inward from other than European ports, on the total amount of freight | 2½ |
| On effecting marine insurance | ½ |
| On procuring settlement of insurance, losses, whether partial or total, also on procuring return of premium, on the amount recovered | 2½ |
| On settling insurance as agents for the underwriters or Insurance Companies | 2½ |
| On effecting life or fire insurance, on the premium | 2½ |
| On attending the delivery of contract, goods, or on receiving and delivering goods, or live stock, on the value thereof | 2½ |
| On landing, clearing, and delivering specie from steamers or other vessels when above 10,000 Rupees | 1 |
| On landing, clearing, and delivering specie from steamers or other vessels, if under 10,000 Rupees | 1 |
| On effecting remittances where no charge has been made for collection, or on purchasing, selling, or negotiating bills of exchange | 1 |
| On granting or cashing letters of credit | 2½ |
| On sale and purchase of private bills of exchange | 1 |
| On bills of exchange returned, noted or protested | 1 |
| Interest on overdue pro-notes or bills of exchange | 9 |
| On managing the affairs of an estate for an executor or an administrator | 5 |
| On all debts collected or secured whether by or without process of law or arbitration | 5 |
| On executing the transfer of immovable property | 1 |
| On procuring money on mortgage | 1 |
| On investing money on mortgage | 1 |
| For discharging mortgages as an attorney | 1 |
| On collecting rents | 5 |

| | Per cent. |
|--|-----------|
| On collecting interest | 5 |
| On landing and reshipping goods, except as under from any vessel in distress, stranded, or wrecked, or on landing or selling by auction damaged goods from any such vessel, and acting as agent for the Master on behalf of all concerned, on the declared value of all such goods as may be reshipped and on net-proceeds of all such goods as may be publicly sold | 5 |
| If opium, indigo, raw silk or silk goods | 2½ |
| If treasure, precious stones or jewellery | 1 |

(The Wharf and Warehouse Company, Limited.)

Goods not enumerated in the schedules of landing and shipping charges, such as coal, coke, timber, ballast, iron or machinery exceeding one ton in one piece, explosives, pianos, carriages, specie and other valuable packages, live stock, etc., etc., to be charged for by agreement.

The charge for transshipping from one vessel to another in the harbour of such goods as are enumerated in the schedule will be at the rate of 9 Rupees per boat-load of quantities named in the schedule of exports.

The company will also be prepared to clear goods for constituents on most favourable terms. The charges incurred for landing, duty, rent, cart and cooly hire, and for delivering either at the railway station or at any part of Colombo, will be made, with agency at 1 per cent. on invoice value, but in no case will an invoice be cleared for a less sum than 1 Rupee and 50 cents.

Special terms can be arranged by the Manager with mercantile firms or others who are large importers, and who may wish the company to conduct their clearing and forwarding and shipping work.

Goods received for shipment, bills of lading obtained, and insurance provided, as may be desired by shippers.

Persons leaving for England can have goods (furniture, etc.) stored at moderate rates, and covered, if desired, by insurance.

Schedule.

Imports.

| | | | Rs. | cts. |
|--------------------------|--|------------|-----|------|
| * Asphalt | — | per ton | 1 | 75 |
| * Cement | — | per barrel | 0 | 37½ |
| * Cotton goods | In bales or cases of ordinary size | each | 0 | 45 |
| Earthenware | Crates or casks of ordinary size | „ | 1 | 10 |
| | Of large size | „ | 1 | 25 |
| Fish (dried) | In packages not exceeding 1 cwt. | each pkge. | 0 | 8 |
| | Exceeding 1 cwt. | per cwt. | 0 | 8 |
| * Flour | In burrels | each | 0 | 45 |
| | In bags of 200 lbs. | „ | 0 | 20 |
| Glassware | In crates or casks | „ | 1 | 25 |
| * Gunny bags | Manufactured jute and such like goods in bales | „ | 0 | 45 |

* Discount of 25 per cent.

† Discount of 10 per cent.

| | | | Rs. | cts. |
|---|---|--------------|-----|--------|
| * Hardware | In casks or cases of ordinary size | each | 0 | 75 |
| | Of large size | " | 1 | 25 |
| † Iron | In bars, bundles, hoops, plates, pig, or package not exceeding one ton in weight | per ton | 1 | 50 |
| † Manure | — | " | 1 | 50 |
| * Nails, etc. | In kegs or drums of 1 cwt. | each | 0 | 20 |
| * Oil, turpentine, etc. | In drums of 5 gallons | " | 0 | 30 |
| | According to size : | | | |
| * Oilman-stores | Packages of 1 dozen size | " | 0 | 20 |
| | " 2 " | " | 0 | 40 |
| | " 3 " | " | 0 | 60 |
| Parcels | And small packages, not over 25 lbs. in weight (not containing valuables) | " | 0 | 20 |
| Rice and grain | Per bag of 164 lbs. | " | 0 | 07 net |
| † Sugar † | " " 164 " | " | 0 | 10 |
| † Staves | Hogsheads | p. 100 bdls. | 9 | 50 |
| | Puncheons | " | 11 | 0 |
| * Tar | In barrels | each | 0 | 45 |
| † Vegetables and miscellaneous articles | Such as potatoes, onions, ginger, pepper, saffron, arrowroot and such like. If in baskets or robbins not exceeding 1 cwt. | " | 0 | 8 |
| | Or if in larger packages | per cwt. | 0 | 8 |
| | In butts and pipes | — | 1 | 80 |
| | Puncheons | — | 1 | 25 |
| | Hogsheads | — | 0 | 65 |
| * Wines, spirits and malt liquor | Barrels of bottled Beer or Porter | — | 0 | 35 net |
| | Quarter casks | — | 0 | 40 |
| | Cases of 3 dozen | — | 0 | 60 |
| | " 2 " | — | 0 | 40 |
| | " 1 " | — | 0 | 20 |

*Exports.***Rates for receiving and shipping goods,**

| | | | | |
|--------------|-------------------------|-----------------------|------|----------------|
| Rs. 5.25 per | 18 casks | not exceeding 10 cwt. | each | } Coffee. |
| | 30 tierces or hogsheads | " 6 " | " | |
| | 40 barrels | " 4 " | " | |
| | 120 bags | " 1½ " | " | |
| | 12 pipes | " 18 " | " | } Coconut oil. |
| | 20 puncheons | " 10 " | " | |
| | 30 hogsheads | " 5 " | " | |

* Discount of 25 per cent.

† Discount of 10 per cent.

‡ Sugar in barrels 10 cents per cwt.

| | | |
|------------------------------|---|---|
| Rs. 5.25 per boat-load of | { | 60 bales cinnamon of 100 lbs. each; larger or smaller bales in proportion. |
| | | 160 bags cinnamon chips. |
| | | 30 bales cinchona of 335 lbs. each; larger or smaller bales in proportion. |
| | | 30 cases cinchona of 336 lbs. each; larger or smaller cases in proportion. |
| | | 160 bags cinchona (not pressed). |
| | | 50 bales cotton wool of 300 lbs. each; larger or smaller bales in proportion. |
| | | 120 bags cacao not exceeding $1\frac{1}{2}$ cwt. each. |
| | | 40 barrels plumbago not exceeding 5 cwt. each. |
| | | 100 cases or chests of tea of 100 lbs. each; larger or smaller cases or chests in proportion. |
| | | 50 bales jute of 300 lbs. each; larger or smaller bales in proportion. |
| Rs. 6 per boat-load of | { | 40 bales gunnies of 300 lbs. each; larger or smaller bales in proportion. |
| | | 2,000 dholls, or 800 ballots or 40 bales of coir yarn, fibres, etc. |
| | | 6 120 cwt. deer horns in bundles. |
| | | 6 100 loose. |
| | | 6 160 ebony. |
| | | 7 5,000 (in number) cocoanuts. |
| | | 6 100 cwt. spanwood. |

N.B.—No quantity, however small, can be charged less than half a boat-load.
20 per cent. discount on above.

Rates for Warehouse Rent.

I.—Imports.

Transit warehouse, single rates, as provided for under the terms of the lease.

| | | | | | Cts. |
|--|---|---|---|------------|------|
| For each butt, pipe, or puncheon | . | . | . | for a week | 50 |
| " half pipe or hogshead | . | . | . | " | 25 |
| " barrel or quarter cask | . | . | . | " | 15 |
| " cask or keg of smaller size | . | . | . | " | 10 |
| " crate, cask or case hardware, earthenware or ironmongery | . | . | . | " | 25 |
| " bale, case or box, measuring 60 cubic feet or upwards | . | . | . | " | 25 |
| " " " 40 cubic feet and under 60 cubic feet | . | . | . | " | 20 |
| " " " 25 " 40 " " | . | . | . | " | 15 |
| " " " 15 " 25 " " | . | . | . | " | 12 |
| For each bale, case or box measuring 10 cubic ft. and under 15 cubic ft. | . | . | . | " | 8 |
| " " " 5 " " 10 " " | . | . | . | " | 6 |
| " small box or package | . | . | . | " | 4 |
| " bag of rice or sugar | . | . | . | " | 4 |
| For beer, wine or spirits, in bottles, per dozen quarts | . | . | . | " | 4 |
| " coir yarn or rope, in ballots or bundles, per cwt. | . | . | . | " | 5 |
| Heavy goods, such as metal or timber, per ton | . | . | . | " | 25 |

1. Other goods of like size and weight to be charged in proportion to these rates.
2. Goods left on the quay, half the above rates; but manure will be charged full rates.
3. Goods may remain in the Transit Warehouse free of rent for three days exclusive of Sundays and holidays, after which they will be subject to double the above rates. A week's rent will be charged for all fractions of a week.

II.—Bonded Warehouse.

The following rates will be charged on all goods warehoused in the Bonded Warehouse.

Rent will commence on the day the goods are deposited therein, and a week's rent will be charged on all fractions of a week.

| | Cts. |
|--|------|
| For each butt, pipe or puncheon per week | 40 |
| „ half pipe or hogshead „ | 20 |
| „ barrel or quarter cask „ | 12 |
| „ octave or cask of like size „ | 8 |
| „ crate, cask or case of hardware, earthenware, or ironmongery . . . | 20 |
| „ bale, case or package, measuring 60 feet or upwards . . . | 20 |
| „ „ „ 40 cubic feet and under 60 cubic feet . . . | 16 |
| „ „ „ 25 „ 40 „ . . . | 12 |
| „ „ „ 15 „ 25 „ . . . | 8 |
| „ „ „ 10 „ 15 „ . . . | 6 |
| „ „ „ 5 „ 10 „ . . . | 4 |
| „ smaller box or package | 2 |
| „ bag of sugar or rice | 4 |
| Iron or other heavy goods in bulk, per ton | 20 |
| Beer, wine or spirits, per dozen quarts | 1 |

III.—Exports.

The following rates will be charged on all goods brought for shipment. Such goods will be allowed three clear days free of rent, after which they will become liable to the payment of daily rent.

| | Cts. |
|--|------|
| For each leaguer, pipe or cask of like size for a day | 25 |
| „ hogshead, or cask of like size „ | 12 |
| „ cask or barrel of coffee, not weighing more than 3 cwts. gross . . . | 6 |
| „ „ weighing more than 3 and not exceeding 7 cwts. | 8 |
| „ „ „ 7 cwts. | 12 |
| „ barrel of plumbago | 7 |
| „ bale, case, or package measuring 60 cubic feet and upwards . . . | 25 |
| „ „ „ „ 40 cubic feet and under 60 cubic feet . . . | 20 |
| „ „ „ „ 25 „ „ 40 „ . . . | 15 |
| „ „ „ „ 15 „ „ 25 „ . . . | 12 |
| „ „ „ „ 10 „ „ 15 „ . . . | 8 |
| „ „ „ „ 5 „ „ 10 „ . . . | 6 |
| „ smaller box or package | 2 |
| „ bag of coffee | 4 |
| Coir goods in ballots or bundles, per cwt. | 4 |

No rent charged for goods brought to the wharf and removed therefrom on the same day.

No rent charged for goods on days when the storm flag is hoisted.

Warehousing Charges at Leyden Bastion.

The Company having provided accommodation in their Leyden Bastion warehouses for goods sent there preparatory to shipment, the following rates will be charged for the same:—

| Particulars. | Rate per day exclusive of cooley hire, loading and unloading. | | Rate for cooley hire, loading and unloading at warehouses. | |
|---|--|------|---|------|
| | Rs. | Cts. | Rs. | Cts. |
| For each cask or package exceeding 5 cwts. each | 0 | 3 | 0 | 3 |
| „ tierce or barrel of 5 cwts. or under | 0 | 2 | 0 | 2 |
| „ bags of rice or coffee, each | 0 | 1 | 0 | 1 |
| For coir goods in ballots or bundles, per cwt. | 0 | 1 | 0 | 1 |
| For each barrel of plumbago | 0 | 2 | 0 | 2 |

Other goods in like proportion.

In all cases goods shall be liable to rent from and for the day on which they are brought and delivered.

Constituents requiring the Company to remove their goods from the warehouse to the wharf will be charged the cost price for conveyance in addition to the above rates.

The foregoing rates are subject to a discount for such goods as may be shipped in the Company's boats.

Rates for Export Goods received at Import Premises at Wharf.

For goods received for shipment at No. 5 Import Warehouse, Wharf, the same rates will be charged as at the Government export premises (less discount for such goods as may be shipped in the Wharf and Warehouse Company's boats). Cost of removal from import warehouses to export warehouses or jetties to be on shipper's account.

Pilots.*At Colombo, Galle and Trincomalee.*

Pilots detained on board any vessel longer than 24 hours are, by the Ordinance, entitled to claim eight shillings for every day's detention after that time.

Application for pilots to be made to the Master Attendant in writing, or by signal. All vessels entering or leaving the ports of Colombo, Galle, and the inner harbour of Trincomalee pay pilotage, whether they make a signal for a pilot or not.

All vessels above 200 tons burthen arriving within the inner harbour at Trincomalee, and all vessels taking a pilot, whether they anchor within the harbour or not, pay Rupees 7½ inwards and outwards.

Light Dues collected at Ceylon Ports.

Minicoy 2½ cents. of a Rupee per ton.

Basses Lights 7½ cents. of a Rupee per ton.

Boat Hire.

| | Each adult passenger. |
|---|--------------------------|
| From the jetty to any vessel within the breakwater | 25 cents. |
| From any vessel to the jetty | 25 cents. |
| From any vessel to another vessel | 25 cents. |
| For a trip within the breakwater including one hour's detention alongside one or more vessels | 50 cents. |

Between 6 P.M. and 9 P.M. an additional $\frac{1}{2}$ rate may be charged.

Between 9 P.M. and daylight double rates.

For boats detained alongside vessels after one hour's detention, an additional $\frac{1}{3}$ rate for every hour.

Gangs of coolies of 5 or more persons $\frac{1}{2}$ of the above rates.

Flagstaff Signals.

1. The upper yard is used for notifying the approach of 3 masted vessels only.
2. Square flags represent square, and burgees fore and aft rigged vessels.
A Ship signal is blue, white, red, horizontal. A Barque is a burgee blue, white, red, horizontal. A Brig is a square flag white, blue, vertical. A Schooner is a pendant white, red, horizontal. A Sloop cutter, or boat is a red pendant.
3. Foreign ships are known by the national colour hoisted above the flag denoting the nature of the vessel.
4. A blue pendant over a flag signifies a man-of-war, and over the national colour a foreign one.
5. Balls only denote the number of vessels of the same kind in sight; they are never hoisted above the flag they belong to, but under it. One ball under the flag denotes two vessels, two balls, three, and so on.

Signals for Steamers.

The Blue Peter.

Three masted at the upper yard.

Two masted at the lower yard.

Four masted above the upper yard.

When steamers are approaching from the southward the flag is hoisted at the southern yard arm; when from the north from the northern yard arm.

Signals for Mail Steamers.

| For the Orient or P. and O. from Aden | | | | Pendant C. |
|---------------------------------------|---|---|----------|------------|
| " | " | " | Calcutta | " D. |
| " | " | " | China | " F. |
| " | " | " | Bombay | " G. |

If a foreign Mail Steamer, the national colour is hoisted under the pendant.

Flag N. denotes a steamer from Australia.

Port Dues leviable at all Ports except Colombo.

Port dues shall be leviable and payable for entry inwards, and for clearance outwards, on all ships arriving at, or departing from, any port in the island (except Colombo) according to the following table.

Provided always, that when a vessel has paid Port dues inwards or outwards, she shall not be liable for additional Port dues for goods carried coastwise during the same voyage.

On entry inwards or clearance outwards with cargo, or with passengers, exceeding one person for every two tons; 8 cents per ton.

In case of Mail Steamers the dues are not to exceed 50 Rupees.

Vessels trading on the coast in the island are allowed to compound for Port dues for 12 months at 50 cents per ton.

Exemptions.

On entry inwards in ballast or with cargo, reported for exportation, and the vessels leave the port with breaking bulk or landing passengers, exceeding one person for every two tons. Free.

On clearance in ballast or with the original cargo, if the vessel leaves the port without shipping goods or passengers, exceeding one person for every two tons. Free.

Ships of 250 tons and upwards, not being Mail Steamers, landing cargo not exceeding 10 tons, and shipping cargo not exceeding 10 tons. Free.

Negombo may be known from seaward by its prominent point which is covered with cocoanut trees.

The fort is in Latitude $7^{\circ} 12' 9''$ N., Longitude $79^{\circ} 53'$ E. The best anchorage in the N.E. monsoon for large steamers is with the fort bearing East, magnetic, in $6\frac{1}{2}$ fathoms, about a mile off the point.

This anchorage is not safe in the S.W. monsoon. The port has a considerable trade, but it is only frequented by native craft. It is connected by canal with Colombo.

Small vessels can cross the ledge of rocks that extends from the point, and anchor in from 12 to 18 feet, with the point bearing S.W. $\frac{1}{2}$ W., magnetic, and the fort S.E. by E. magnetic, less than $\frac{1}{2}$ a mile from the beach. Negombo Lake is 5 miles long and about 2 broad.

Chilaw, in Latitude $7^{\circ} 34'$ N., Longitude $79^{\circ} 47'$ E., is a small port of little importance. It may be known by a large bungalow on the beach abreast the town.

The anchorage is safe to approach from the southward, and steamers can anchor in 5 fathoms, soft mud, opposite the river mouth, with Chilaw Point bearing S.E., magnetic, about $\frac{1}{2}$ a mile from the shore.

Between Chilaw and Kalpentin Island there are numerous shoals, and the coast is not safe to approach within 5 miles, except by small light draft steamers, which can pass over the shoals in safety.

Kooramallai. Very good anchorage for small steamers may be found in the S.W. monsoon, under the lee of the point, which is in Latitude $8^{\circ} 32'$ N., Longitude $79^{\circ} 51'$ E. It may be known by the 3 long hills seen over the low land. Making for the anchorage the N. end of the hills should be kept on an E. by S. bearing till well past Karativo Island.

The anchorage is in 12 to 18 feet of water, sandy bottom, with the rocky promontory bearing between *S.S.W.* and *S.W.*, magnetic, a mile distant.

Condachi is a small village at the bottom of the bight between Modregam Point and Aripo River mouth. This part of the coast is only of importance during the pearl fishery when large numbers of people resort there. Mounds of shells several feet high may be noticed along the coast for miles, these are the accumulations of ages, oysters having been flung into heaps year after year all along the shore.

The first land-mark is a building known as Doric and is now partially destroyed. It was erected as a temporary residence for the Governor of Ceylon.

During the progress of a fishery this dreary expanse becomes enlivened by the crowds who congregate from distant parts of India, and a temporary town suddenly springs up. The British India Company's steamers call here at regular intervals.

Manaar was formerly the seat of the pearl fishery.

The fort was built by the Portuguese, and strengthened by the Dutch.

The most singular objects on the island are the monstrous Boabab trees, one of which measures 30 feet in circumference.

The Maldive Islands.

A few remarks about the Maldive Islands may be interesting, though it will be quite impossible to give more than passing notice to any but the principal channels ordinarily used by steamers.

The islands are grouped together in Atolls, lying between 1° *S.* and 7° *N.* Latitude, and between $72^{\circ} 30'$ and $73^{\circ} 45'$ *E.* Longitude.

The number of groups is reckoned at 13, although there are popularly supposed to be 12,000 islands. The following is a list of the 13 Atolls, in order from the North, and the number of islands that are inhabited :—

- | | | | | |
|----|-------------|------|----|--------------------|
| 1. | Tilladumati | with | 17 | inhabited islands. |
| 2. | Milladumodu | „ | 32 | „ „ |
| 3. | Paddipholo | „ | 2 | „ „ |
| 4. | Malosmadu | „ | 30 | „ „ |
| 5. | Ari | „ | 13 | „ „ |

| | | | |
|-----|--------------|--------|--------------------|
| 6. | Mali or Male | with 8 | inhabited islands. |
| 7. | Phalidu | „ 5 | „ „ |
| 8. | Moluk | „ 8 | „ „ |
| 9. | Nillandu | „ 18 | „ „ |
| 10. | Collomandu | „ 11 | „ „ |
| 11. | Adumati | „ 12 | „ „ |
| 12. | Suadiva | „ 17 | „ „ |
| 13. | Addu | „ 7 | „ „ |

The total number of inhabitants is unknown, but the population is estimated at 200,000. Our early knowledge of the Maldives is mainly derived from the travels of Ibn Batuta, who visited the islands in 1340 A.D., and is said to have married a daughter of one of the Wazirs.

There are also the adventures of a Frenchman, who was shipwrecked in 1602 on one of these islands, and was detained for five years, when he escaped in a passing ship.

The islands were surveyed in 1834-35 by Lieut. Christopher, R.N., and his observations and account of the islands have been printed in the Royal Asiatic Society's Journal.

From time immemorial the Maldives have been in a sense dependent upon Ceylon, and at the present day the political connection of the islands is with Ceylon and not British India.

The Sultan sends an annual embassy to the Governor of Ceylon, with a tribute of cowries, fish, and cakes, and claiming the protection and favour of the British Government. The Governor in return stipulates for help to all Europeans wrecked on the islands.

The native name is Mahaldib, from "Mali," the chief Atoll, and "dwipa," the Sanskrit for island.

The language of the people at the present day has many points of resemblance to the modern Sinhalese, and there are three different kinds of written character to be found on walls and tombstones.

The most ancient are called Dawehi Hakura, the next is the Arabic, and the third called Gabali-Tana, which is the common dialect, but their language is intermixed with many foreign words.

They use the letters of the alphabet as numerals, and count by twelves instead of tens.

According to Ibn Batuta, their conversion to Muhammedanism probably took place in 1200 A.D.

The traces of Buddhism are faint, and though the Sinhalese have retained their faith, the children they sent to colonize these islands have embraced the Muhammedan religion, and it is said that a Mussalman missionary worked upon the superstitious feelings of the islanders by exorcising, through the efficacy of the Koran, a sea-demon, who was supposed to play havoc among the island maidens.

The colonization of the islands probably took place at the end of the 4th century A.D., and they are spoken of from time to time by Pyrrard, Pappus of Alexandria, and Fa Hian, in the 5th century. Ptolemy and Cosmos also speak of them as producing pearls and precious stones, and again, in the 11th century, they are mentioned by Al Biruni, who calls the people *Devi*, and distinguishes them from the Laccadives by calling them the cowrie and the coir islands.

The people are civilized, timid and inoffensive; the women are not pretty, and are afraid to be seen, even by a European.

The men are good sailors and navigators, and trade in their curiously built ships to Calcutta, Ceylon, Burma, Chittagong, Mauritius and the Malabar Coast.

There are schools for teaching the boys navigation, as on the Laccadives, and they are taught to use their sextants, and other nautical instruments, and understand the chart, and the deviation of the compass.

Some of the people are in appearance like the Malabar Coast natives, while others, especially in the King's island, are almost black, with curly hair and of fine proportions, probably the progeny of Zanzibar slave girls, that are brought from Maskat from time to time.

The islanders are particularly good to shipwrecked sailors, and truly hospitable, but they have a curious idea that once a vessel has been left by the captain and the crew, she belongs to them with all her cargo, nor will they attempt to save anything until they have obtained the Sultan's permission. The Sultan lives on Mali Island, which has about 1,500 inhabitants, and is the seat of the Government.

All the produce of the many islands is brought to the King's island, and all the foreign trade is carried on there.

The foreign traders from Chittagong, Malabar, Maskat, and elsewhere, generally arrive and leave between January and May. The boats for Calcutta and Chittagong, belonging to the islands, usually leave in September, and return in December and January.

The principal exports are bonito fish, tortoise shell, cowries, cocoanuts, coir yarn, and sweetmeats.

The imports are rice, dates, salt, tobacco, supari, and ordinary bazaar cargo.

About 12,000 cowries can be purchased for a Rupee.

The climate is very unhealthy, much more so than the Laccadive Islands, and is deadly to Europeans.

Amongst the different groups of islands there are good channels for ships, but some should never be attempted, except by steamers, as the currents run strong.

Some of the numerous gateways, as they are called, will admit the largest steamers. I do not, however, intend to mention any of these minor channels.

The entire passage between Addu and Suadiva Atolls is known as the equatorial channel, but the Island Fua Mulaku lies athwart the channel, and about midway between Addu and the equator. This channel is free from danger. It is high water, full and change, at 1 hour, and the springs rise about 5 feet.

The one and a half degree channel is situated between Suadiva and Adumati, and is also free from all dangers. It is generally used by vessels from Mauritius or the Cape, bound to Ceylon ports.

The eight degrees channel is 69 miles in width between Minikoi Island and the head of the Maldives. The channel is perfectly safe, steamers generally keep close to the island in the *N.E.* monsoon, but during the *S.W.* monsoon they incline towards the other side of the channel.

The Lighthouse on Minikoi is 122 feet high and painted white, and exhibits, at an elevation of 150 feet above high water level, a revolving white light every half minute, visible in clear weather 19 miles.

On a *S.* 39° *W.* bearing (in line with the length of the island) this light is obscured by cocoanut trees, within a distance of about 8 miles; this obscuration extends through an arc of 74° to the bearing of *N.* 67° *W.*, when the distance the light is obscured decreases to about $1\frac{1}{2}$ miles. The top of the Lighthouse and the lantern are visible by day above the trees.

The nine degree channel is bounded on the South by Minikoi Island, and northward by Suheli and Kalpeni Islands, belonging to the Laccadive Islands, and is 108 miles wide. This channel is also perfectly safe.

Although Minikoi Island really belongs to the Laccadive group of islands it seems better to mention it here, as it more properly belongs to the Maldivé group.

The Island of Minikoi was purchased by the Sultan Ali Raja of Cannanore, from the Sultan of the Maldives. It is under the jurisdiction of the British authorities, and is administered by the Collector of Malabar.

It is thickly populated and the proportion of females is nearly 26 per cent.

The boys of Minikoi follow their fathers to sea at an early age, and many of them now serve as lascars in English steamers; they generally make up a whole ship's company, and are patronized principally by the Asiatic Steam Navigation Company and man several of their fine steamers, and the captains speak very highly of their efficiency and steady conduct.

Monogamy is universal, and the women appear in public freely, and take the lead in everything but navigation.

It is possible to get to the inner anchorage inside the lagoon, but it should not be attempted without a pilot, who will be readily provided for moderate payment.

The usual anchorage during the *N.E.* monsoon is in 10 fathoms on the West side of the island, and about 3 cables' length from the barrier reef, and when swung towards the reef with 5 fathoms under the stern.

It is necessary though to keep a constant watch on the vessel, and the other anchor and a kedge should always be in readiness and steam kept up.

During the *S.W.* monsoon the anchorages must be found on the *N.* and *E.* sides of the islands, but they are very insecure.

With reference to the approaches to Mali Island it should be remembered that the sandbank to the *N.W.* of Fureenahfarhi has no bushes on it or any kind of vegetation.

It is very small and composed of white sand, which shows up well in the sun, is only 1 foot above high water and has an encircling reef.

There is a small but densely wooded island in Latitude $4^{\circ} 18' 15''$ *N.*, Longitude $73^{\circ} 28' 15''$ *E.*, and the island marked on the chart in Latitude $4^{\circ} 12' N.$, Longitude $73^{\circ} 28' 30'' E.$, is really part of the reef which is a complete circle and entirely submerged.

CHAPTER IV.

Western Ports in Native States and Madras Presidency.

There are no ports between Manapad Point and Cape Comorin, but numerous fishing villages and small whitewashed churches may be seen dotted along the coast. The coast should not be approached closer than the 10 fathom line.

Cape Comorin, in Latitude $8^{\circ} 4' 20''$ N., Longitude $77^{\circ} 35' 35''$ E., is the extreme southern point of India.

In the *Periplus*, reference is made to a harbour here, but this has now disappeared owing to encroachments from the sea, although a well of fresh water in a rock a little way out to sea, seems to support the theory of its former existence.

The derivation of the word is probably "*Kumâri*," a virgin, and at the village near the cape of the same name a bathing festival is still continued in honor of *Durgâ*, the virgin-goddess, after whom the place is named. It is not easily distinguished, but is said to have a more reddish appearance than the surrounding hills, and there is a house near the beach painted white. At its extreme point there is a small pagoda, and 300 yards to the N.W. is the resident's bungalow and a flagstaff, and 3 miles to the north of the pagoda stands *Watakota* fort.

The Travancore Government have decided to open or revive the old port of Comorin, and say there is safe anchorage for ships of moderate size within half a mile of the shore, and that steps will be taken to prevent capitalists monopolizing all the valuable land.

A light is recommended and the laying down of buoys to mark the anchorage, and also the erection of a substantial landing stage and covered warehouses. Cargo boats will be provided by Government, until such times as this work is undertaken by private enterprise.

Government have connected the port with the main road, and have opened a Sea Custom House.

The importance of the new port has already begun to manifest itself, and many merchants have purchased plots of land, with a view to business in the near future.

A good business is done in collecting and exporting large quantities of pink colored sand, known as garnet dust.

The situation of the harbour affords sufficient protection against the severity of the monsoons, and if the Liners could be induced to call, the Government and the people of Travancore would no doubt, be benefitted materially.

Muttum Point Light, in Latitude $8^{\circ} 7' 30''$ N., Longitude $77^{\circ} 18' 10''$ E., is situated on the rocky promontory 300 yards from the sea. It is a fixed, white, dioptric light of the 1st order, visible from N. 64 W. through North and East to S. 84° E., standing 142 feet above high water level, and can be seen 17 miles in clear weather. The Lighthouse is built of granite, showing white and black horizontal stripes from seaward.

The weather being often very hazy in this neighbourhood, the Lighthouse is generally very difficult to distinguish until quite close in, and when on a bearing with the higher land at the back.

There is, however, a thin grove of Palmyra palms, the centre of which bears about N. by E. $\frac{3}{4}$ E., distant about one mile from the Lighthouse. This is a most valuable landmark, being always above the thickest part of the haze, and it can be picked up long before anything can be seen of the Lighthouse. The size of the grove is about 0.3 mile in length and breadth.

It stands on the high, red ground at the back of the Lighthouse, and the tops of the trees are about 280 feet above the sea. It is difficult to understand why this excellent landmark is not shown on the chart.

Crocodile Rock is a dangerous sunken rock. A small part of the rock sometime shows above water, but it does not always break.

It lies with Kota Islet, bearing N. 9° W. magnetic, Adunda Islet, bearing N. 33° E., magnetic, and Muttum Lighthouse, N.E. $\frac{3}{4}$ N., $\frac{3}{4}$ miles distant. There are numerous other shoals and rocks in its vicinity.

Kota Islet is 12 feet high, and lies N.W., $1\frac{1}{4}$ miles from Adunda Islet, and there is foul ground to the southward and east of it.

Adunda Islet is only 8 feet high, with foul ground all round it. It lies *S.W. $\frac{1}{4}$ S.*, 1 mile from Muttum Lighthouse.

There is a passage between the Islets and Crocodile Rock, but steamers bound to Kolachel should not use it, and several large steamers have come to grief in it.

Adundu Islet is difficult to distinguish from seaward.

Kolachel, in Latitude $8^{\circ} 10' N.$, Longitude $77^{\circ} 19' E.$, is 5 miles *N.W.* of Muttum Point. It is a port of some importance, and is a regular port of call for the British India Company's coasting steamers, and an occasional outside steamer calls here to load jaggery. Travancore coffee is prepared and exported from here.

The port was of value centuries ago. It was at one time occupied by the Danes, and it is referred to by Bartolomeo as a safe harbour well known to the ancients.

The best landmarks when approaching the anchorage are a round hill, 250 feet high, 4 miles north of Kolachel, a high tree, and the flagstaff and church in the town.

The best anchorages are in 11 fathoms, abreast Kolachel, with the hill bearing *N.* by *E.* magnetic, and Muttum Lighthouse, *E.S.E.* magnetic; or in 7 fathoms with the high tree open to the westward of the flagstaff, and swinging room clear of Pulunny Rock, which is 6 feet high.

The high tree is now quite useless as an anchoring mark as other trees have grown up round it and it is now indistinguishable.

The flagstaff is about $\frac{1}{2}$ a cable inland and Pulunny Rock bears from it *S.S.W.* 4 cables distant.

The Rock has 6 to 7 fathoms quite close to it, except to the *N.W.*, where there is rather less water. There are no dangers to the Eastward or the Southward of the Rock.

The Patna Rock, with $1\frac{1}{4}$ fathoms on it, bears *W.* by *N.* 1 cable from Pulunny Rock.

In shore of the anchorage the 5 fathom line is about $1\frac{1}{2}$ cables from the beach. Anchor as follows:—

Flagstaff *N.W.* by *N.* in $7\frac{1}{2}$ to 8 fathoms, 2 to 3 cables to *S.E.* of Pulunny Rocks, and about 4 cables from the beach.

A red buoy is moored during the fine season a short distance south of the easternmost rocks, where the B.I. steamer "Patna" touched.

From Cape Comorin to Covelong numerous little whitewashed Roman Catholic churches may be seen on the beach.

Covelong Point is a bluff cape, and may be distinguished by the white building on it.

Trivandrum is the capital of Travancore, in Latitude $8^{\circ} 29' 30''$ N., Longitude $76^{\circ} 59' 18''$ E. The Observatory stands on a hill, and is a good landmark, being 196 feet above high water level. It was built by the Maharajah in 1836, and for many years interesting scientific observations were recorded, chiefly magnetic and meteorological. The last astronomer was Mr. J. A. Broun, F.R.S., but in 1865 the establishment was broken up on the score of expense.

The Maharajah's palace, at Shungomogung, close to the water's edge, about 2 miles west of the town, is a conspicuous object.

There are sufficient boats and men for the requirements of the port. Dues 1 Anna per registered ton.

A succession of canals, running along the coast, connects all the backwaters, and, with only one break, put the town in connection with the great backwater system of Travancore and Cochin, and with the Madras Railway.

The break was at Warkalli, 20 miles North of Trivandrum, where high laterite headlands abut on the sea. Heavy works were begun some years ago to remove this obstacle by open cuttings and tunnels, to complete the continuity of this waterway. The work was completed in 1892.

A railway is under construction in connection with the South Indian Railway.

A good anchorage will be found in $12\frac{1}{4}$ fathoms of water and $3\frac{3}{4}$ cables from the beach, which is very steep to, on the following magnetic bearings:—

Ponderu Church - - - N.E. $\frac{1}{4}$ E.

Shungomogung Palace - - N. by W. $\frac{3}{4}$ W.

North Bluff of Tableland - E. by S. $\frac{1}{4}$ S.

The above is a very good anchorage. Ponderu Church is 1 cable from the sea and has a small grove of dwarf cocoanut palms in front of it.

When approaching the anchorage from the N.W. the church is hidden by trees until it bears about E. by S.

At this anchorage the 5 and 10 fathom lines are $1\frac{1}{4}$ and $2\frac{1}{4}$ cables from the beach.

The town of Trivandrum is rather more than a mile inland, its port being shown as Ponderu.

With the church on the bearings given above, the soundings are as follows :—

| | | |
|-----------|---|-------------------------|
| 5 fathoms | - | 1 cable from the beach. |
| 9 „ | - | 2 cables „ „ |
| 11½ „ | - | 3 „ „ „ |

In addition to Pondera Church the only buildings visible near the beach are a thatched godown, showing several symmetrical gables with their ends towards the sea, and a small whitewashed house with a red tiled roof.

There are small white churches in almost every village along this coast.

Anjengo, “anju-linga” or “five cocoanut trees.” The fort is in Latitude $8^{\circ} 39' 40''$ N., Longitude $76^{\circ} 45' 15''$ E., but is not easily distinguished from seaward. The best marks are a church on the beach, with a white front, $\frac{1}{5}$ of a mile N.W. of the fort, and a bungalow on the hills, 2 miles north of the fort.

Anjengo was formerly an important place, but is now a mere fishing village.

The fort was erected by the English in 1695, and as far back as 1792 the port was reported to be in hopeless decline. It is of interest as being the place where Robert Orme, the historian, lived for many years, and Eliza Draper, the lady of Sterne's affections.

The port is seldom visited, and the anchorage is unsheltered, with a heavy surf always beating on the beach even in the finest weather. An anchorage may be found, however, in 10 to 12 fathoms, sand and shells, with Naimum Hill S.E. by E., and Anjengo Flagstaff N.E. by E., both bearings magnetic, about 1 mile from the beach.

Quilon, in Latitude $8^{\circ} 53'$ N., Longitude $76^{\circ} 34'$ E., is the third largest town in the Travancore State, and the second port. It is one of the oldest towns on the West Coast.

The ancient history of Quilon goes back to the days of the primitive Syrian Church in India, and is mentioned as Coilon by the historian Patriarch Jesujabus, who died in 660 A.D. An account of Quilon appears in Arabic writings, in 851 A.D., and it is mentioned by Marco Polo, who calls it Coilum, and latter on, in the 16th century, Barbosa speaks of it as a very great city, with many rich merchants.

Throughout the middle ages it was the chief seat of the Saint Thomas Christians, and formed one of the seven churches.

A British Native Regiment is stationed here, whose cantonments lie east of the town.

A fixed, white light visible 8 to 10 miles in fine weather has been fixed on the flagstaff belonging to the coffee works.

The old Flagstaff on the fort is partially dismantled, and is not used by the shipping, another staff having been erected on the beach, opposite the anchorage, for signalling purposes.

A tall, circular, iron chimney, belonging to the Scottish Company's Coffee Works, is a good land-mark.

Two buoys are laid down during the working season, to mark the anchorage.

The red buoy marks the South extreme of the Tangacheri Reef, and lies in 27 feet water, 1 mile *S.E.* of the old flagstaff on the Point, and $\frac{9}{10}$ of a mile *S.W.* by *W.* $\frac{1}{2}$ *W.* from the factory chimney.

The black buoy marks the North extreme of other patches of rock extending parallel with the shore, with 22 feet least water on them. This buoy is in 35 feet of water, $1\frac{1}{2}$ miles *S.E.* $\frac{1}{2}$ *S.* from the old flagstaff on the Point, and 1 mile *S.W.* $\frac{3}{4}$ *S.* from the factory chimney. The ground inside the buoys is all more or less foul.

The anchorage is quite safe to approach, and a good berth will be found between the buoys, in $4\frac{1}{2}$ to 5 fathoms, sand, with the factory chimney, bearing *N. 45° E.*, magnetic, and the extreme of Tangacheri Point *N. 68° W.*, magnetic. The port is closed from May to end of September.

The chief exports are timber, tea, coffee, senna, cocoa, fibre, cinchona, lemon-grass oil, salted fish, tamarinds, pepper, and nutmeg, valued at 10,00,000 Rupees.

The imports are principally salt, kerosene oil, tobacco, liquors, metal, piecegoods, and general bazaar cargo from Bombay, valued at 9,00,000 Rupees.

There are 45 licensed boats, and about 200 other boats, that can be used on an emergency, with a total capacity of about 400 tons.

The boatmen work the cargo, and a steamer can always get good despatch. There are about 200 of them always available.

The cost of working cargo is $3\frac{1}{2}$ Annas a ton, and landing and shipping cost from 12 Annas to 1 Rupee 8 Annas a ton, according to the season and nature of the cargo.

To face page 223.

On 1st April, 1902, a group flashing white light, showing groups of two flashes every ten seconds, was exhibited from a grey tower in Latitude $8^{\circ} 53' N.$, Longitude $76^{\circ} 34' E.$ on Tangacheri Point Quilon Roads. The light is elevated 140 feet above high water and is visible 18 miles in clear weather.

There is a good hospital, where European and native seamen are admitted.

Fresh provisions of all sorts are plentiful and cheap, but there are no stores or coal.

Port dues are $1\frac{1}{2}$ Annas per registered ton.

The port is under the charge of a Master Attendant, who is also the chief Customs Officer.

Tangacheri Reef is one of the few dangers on this part of the coast, and should be given a wide berth. It extends $1\frac{1}{2}$ miles to the South-West, 2 miles to the West of the Point, and 6 miles along the coast to the northward.

A group flashing, white light, showing three flashes every 10 seconds, will shortly be exhibited from the reef.

Rates of Hire for Boat.

| | | | | | | Chs. | Chs. |
|---|---|-----|-----|-----|---|------|------|
| Single Boat with 6 oars in fair weather to Pattamars 10 to Ships 20 | | | | | | | |
| Do. | 4 | do. | do. | do. | 8 | do. | 14 |
| Do. | 3 | do. | do. | do. | 7 | do. | 12 |

Night fair weather double the above rates, and night foul weather four rates.

A boat detained over $1\frac{1}{2}$ hours double boat hire, over 3 hours four rates and so on.

Boats detained alongside after 6 P.M., double boat hire in all such cases will be charged to the ships.

The export tariff is 5 per cent. *ad valorem*, except in special cases. Timber is 10 per cent.

C.

Schedule of Boat Hire for the Ports of Colachel and Quilon.

| No. | Articles. | Boat Hire. | | Remarks. |
|-----|---|------------|----|---|
| | | Ch. | C. | |
| 1 | Coffee in bags, each weighing between 1 and 2 cwts. | 2 | — | Each bundle not exceed- ing 3 cwts. |
| 2 | Tamarind, per bundle | 2 | 8 | |
| 3 | Fish, per 4 bundles | 9 | — | |
| 4 | Jaggery, per 3 bundles | 9 | — | |
| 5 | Hides, per bale | 7 | — | |
| 6 | Cotton Twist, per bale | 6 | — | |
| 7 | Longcloth, per bale | 6 | — | |
| 8 | Paper and Gunnies, per bale | 6 | — | |
| 9 | Provisions and Oilmanstores, per cask | 6 | — | |
| 10 | Do. do. per case | 3 | — | |
| 11 | Liquors, per 12 bottles | — | 12 | |
| 12 | Paddy and other grains, per bag | 2 | — | |

| No. | Articles. | Boat Hire. | | Remarks. |
|-----|--|------------|----|----------|
| | | Ch. | C. | |
| 13 | Tea, per chest | 4 | — | |
| 14 | Spice, per chest | 14 | — | |
| 15 | Arecanuts, per bag | 2 | — | |
| 16 | Laurel nuts, per bag | 2 | — | |
| 17 | Crockery, per box | 2 | — | |
| 18 | General cargo, per cwt. | 2 | — | |
| 19 | Timber logs, per candy | 4 | — | |
| 20 | Planks, per corge | 28 | — | |
| 21 | Do. double, per corge | 56 | — | |
| 22 | Cocoanuts, with husk, per 1,000 | 36 | — | |
| 23 | Do. without do. do. | 15 | — | |
| 24 | Copra, per bale | 8 | — | |
| 25 | Ginger, do. | 8 | — | |
| 26 | Turmeric, do. | 8 | — | |
| 27 | Coir, do. | 10 | — | |
| 28 | Iron, Copper and other metals, per candy | 8 | — | |
| 29 | Europe twist, per bale | 4 | — | |
| 30 | Silk cases, each | 2 | — | |
| 31 | Umbrellas, per box | 4 | — | |
| 32 | Crackers, do. | 4 | — | |
| 33 | Jars, per 100 | 35 | — | |
| 34 | Preserves, per chest | 2 | — | |
| 35 | Paddy, per 100 parahs | 8 | — | |
| 36 | Wheat and other grains, per candy | 8 | — | |
| 37 | Passengers, per head | 8 | — | |
| 38 | Ballast, per ton | 14 | — | |

Half the above rates for Pattamars.

Half hire to be added when a boat is used on Sundays, or beyond the hours specified in Rule 14 during ordinary days.

The coast from here to Cochin is all sand, and fringed with coconut trees.

Alleppi, or Alleppey, is the chief port and second largest town in Travancore. It lies between the sea and the backwater, which is more like a large lake here.

The canal, connecting the port with the great backwater to the north-east, passes through the centre of the town, at right angles to the main streets.

A tramway, worked by coolies, conveys merchandise to and from the warehouses to the end of the fine iron pier, which is 500 feet long.

Bartolomeo records that this port was open to trade in 1762, and mentions the canal as being then in existence.

In 1809, some sepoy and European soldiers, who halted here on their way up the coast, were cruelly murdered by the Nairs.

In the fine weather, the best anchorage is in $3\frac{1}{2}$ to 4 fathoms, very soft mud, with the Lighthouse bearing *N. 79° E.*, magnetic.

In the *S.W.* monsoon, in 4 fathoms, with the Lighthouse bearing *N. 56° E.*, magnetic, that is, if it is possible to work off Alleppi.

The anchorage depends entirely upon the position of the mud bank, which shifts its position from year to year, and is sometimes as far as 17 miles south of the port.

The position of the mud bank cannot be properly determined until after the first burst of the monsoon, but the best anchorage is always officially notified, and notices are issued or signalled to all steamers on arrival.

When the anchorage is any great distance away from Alleppi, a temporary flagstaff is erected, for signalling purposes, and to mark the landing place.

The Light, in Latitude $9^{\circ} 30' N.$, Longitude $76^{\circ} 19' E.$, is situated on the beach, and is a white, revolving holophotal, dioptric light of the 1st order, illuminating an arc of 360° , attaining its greatest brilliancy every 40 seconds, standing 113 feet above high water level, and visible 17 miles in clear weather. The Lighthouse column is built of stone, and is painted white.

Fresh provisions are plentiful and both cheap and good.

The water is not good.

The principal exports are coffee, cardamoms, ginger, salted fish, pepper, coir, cocoanuts, copra, etc.

Imports are principally salt, kerosene oil, piecegoods, rice, grains, metal, and the ordinary bazaar cargo.

Rates of Boat Hire at Alleppey.

| | |
|--|-----------------------------|
| 1. Cocoanut with husk | Rs. 1 per 1,000. |
| 2. Do. without husk | chs. 8 " |
| 3. Copra, ginger, turmeric, coffee, pepper, wheat and other grains, in bags or robbins | " $5\frac{1}{4}$ per candy. |
| 4. Metals | " $5\frac{1}{2}$ " |
| 5. Coir in bales and yarn of fibre | " $6\frac{1}{4}$ " |
| 6. Cases of coffee, ginger, etc. | " 7 " |
| 7. Rope, twine, in bundles | " $6\frac{1}{2}$ " |

| | |
|--|------------------------|
| 8. Piecegoods, gunnies, twine, in bale | chs. 4 per bale. |
| 9. Stationery | „ 5½ per candy. |
| 10. Silk cases | „ 2 per case. |
| 11. China paper | „ 2 „ |
| 12. Umbrellas and crackers | „ 3 „ |
| 13. Crockery and preserves | „ 2 „ |
| 14. Jars | „ 17 per 100. |
| 15. Tea—3 chs. per chest, 1½ ch. per ½ chest | „ 1 per ½ chest. |
| 16. Cardamoms | „ 14 per chest. |
| 17. Paddy | „ 6 per candy. |
| 18. Firewood | „ 12 per 1,500 liters. |
| 19. Water | „ 6 per hhd. |
| Do. | Rs. 1-6 per league. |
| Do. in bulk | „ 1-7 per boat. |
| 20. Pilgrims, 15 in number with sundries, embarking or landing | „ 1-2 „ |
| 21. Shipping planks | „ 1 per corge. |
| Do. do. double | „ 2 „ |
| Do. Timber logs | chs. 4 per candy. |

Half the above rates for Pattamars.

Half higher extra to be given for working between 6 p.m. and 5 a.m.

Coolies working cargo on board cost 8 Annas per man.

Landing rice and paddy Rs. 10 per 100 Bags.

„ measurement cargo „ 1-6 per ton.

Sand ballast costs about „ 2-8 per ton f.o.b.

Water „ 1 per cask or 40 gallons.

Rates of Hire for Passenger Boats.

Single boats with 6 oars in fair weather to Pattamar 10 chs., Ships 20 chs.

„ „ 4 „ „ „ „ 8 „ „ 14 „

„ „ 3 „ „ „ „ 7 „ „ 12 „

Night fair weather double the above rates, and night foul four rates.

A boat detained over 1½ hours double boat-hire, over 3 hours four rates, and so on.

Boats detained alongside after 6 p.m., double boat-hire in all such cases will be charged to the ships.

Pier Toll and Tramway Hire.

I.—Pier Toll.

| | | Rs. | As. | P. |
|--|-----------|-----|-----|----|
| Ordinary goods | per candy | 0 | 1 | 0 |
| Heavy goods. | | | | |
| Steam boilers | each | 12 | 0 | 0 |
| Machinery in pieces or any article weighing a ton or upwards | per ton | 2 | 0 | 0 |
| Four wheeled carriages | each | 3 | 0 | 0 |
| Two wheeled carriages | „ | 1 | 8 | 0 |
| Ponies | „ | 1 | 8 | 0 |
| Horses | „ | 2 | 0 | 0 |

| | | Rs. | As. | P. |
|-------------------------------|----------------|-----|-----|----|
| Dogs, sheep and other animals | each | 0 | 1 | 0 |
| Pianoforte | „ | 3 | 0 | 0 |

II.—Tramway Hire.

| | | | | |
|-----------|-------------|---|---|---|
| Per candy | „ | 0 | 1 | 0 |
|-----------|-------------|---|---|---|

Port Dues at Alleppey.

| | | |
|----------------------------|----------------|---------------------------------|
| Steamers | | Pies 9 per ton once in 30 days. |
| Ships and country craft | „ 9 | „ „ 60 |
| Native craft under 20 tons | „ 4½ | „ „ 60 |

Two boundary pillars, each 25 feet high, have been erected as land-marks on the shore. The northern pillar, in approximately $9^{\circ} 30' 15''$ N., $76^{\circ} 18' 40''$ E. with the Lighthouse *S.E.* $\frac{1}{4}$ *S.* $2\frac{9}{10}$ cables, and the southern pillar $1\frac{1}{4}$ miles *S.* by *E.* from the northern pillar.

There are also two buoys in the roads in 4 fathoms. The northern buoy, red, is moored with the northern pillar *N.E.* by *E.* $\frac{3}{4}$ *E.* $1\frac{3}{10}$ miles, and the southern pillar *S.E.* by *E.* $\frac{3}{4}$ *E.*; and the southern buoy, black, is moored with the northern pillar, *N.E.* $\frac{3}{4}$ *N.*, $1\frac{9}{10}$ miles, and the southern pillar *E.* by *N.*

Should the current be from *N.* to *S.*, mariners should take the black buoy as their guide to the anchorage; if from *S.* to *N.* the red buoy.

The buoys are only intended as a rough guide; the mud banks shift frequently and rapidly, so that the lead must be used when approaching the anchorage.

Between Alleppey and Cochin the coast is low and sandy. The most conspicuous object from seaward during the *N.E.* monsoon is the Colemgoode Bluff; it is, however, seldom seen in hazy weather.

A steamer coasting can see the light at Cochin before the revolving light at Alleppey has dipped.

Cochin (Kochchi-Bandar, small port) is one of the largest ports in the Madras Presidency, and the fine harbour and backwater is capable of affording shelter to a large number of shipping.

The town is situated on the south bank of the principal navigable entrance to the great Travancore estuary, along which the town extends for over a mile, and then joins Mattancherri and the Jews' settlement.

Facing Cochin to the north is the island of Vypeen. The island was formed by the joint action of the sea and the backwater, in 1341 A.D.

The many quaint old Dutch buildings give a picturesque appearance to the town of Cochin. It was one of the first spots in India visited by Europeans, and tradition has it that St. Thomas the Apostle landed here in A.D. 52, and from copper plates still in existence it is proved beyond doubt that the Jewish and Syrian churches were firmly established here in the 8th century.

The modern history of the place is also full of interest. In 1500 the Portuguese landed and met with a friendly reception, and in 1502 Vasco da Gama came to Cochin and established a factory.

In 1503 Albuquerque arrived and built the fort, which was called Manuel Kolati, the first European fort in India; it was afterwards enlarged by Menezes in 1525. On Christmas Day, 1524, Vasco da Gama died and was buried in what is now the Protestant Church. His body was removed to Portugal in 1538.

St. Francis Xavier visited Cochin in 1530 A.D., and made many converts.

In 1577 the Society of Jesus published at Cochin the first book printed in India. This statement has been contradicted by many but never satisfactorily proved to be incorrect.

It was visited by some English travellers in 1585, and in 1616 the English assisted the Zamorin of Calicut in attacking the town. In 1663 the town was captured by the Dutch, who greatly improved the place, and built many large houses and extensive quays. They turned the Cathedral into a warehouse, and used the other Roman Catholic Churches as Protestant places of worship. The fort was also completely altered by the Dutch in 1778.

On the conquest of Holland by the French, the English troops, under Major Petrie, besieged and captured Cochin, on the 20th October, 1795. In 1806 the English blew up the Cathedral and destroyed the fort, quays, and many of the fine buildings.

Cochin was formally ceded to the English in 1814.

The exact age of the fine old Protestant Church is not known, but it certainly existed before 1546. It contains many curious old tombstones, many of which have been embedded in the walls, and were carefully preserved and arranged by the Rev. Mr. Sealey a few years ago.

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To face page 229.

The Cochin Shoranur Railway Extension has been opened this year (1902), and if the dredging of the bar and other harbour improvements are carried out there will be a large number of vessels discharging and loading cargo inside the harbour throughout the year.

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One with the word Vasco on it is pointed out as that of Vasco da Gama, but the coat of arms above is certainly not that of da Gama.

Nearly all traces of the fort have now disappeared.

The Light, in Latitude $9^{\circ} 57' 47''$ N., Longitude $76^{\circ} 13' 45''$ E., is situated on a small mound, which formed a bastion of the old fort to the south of the harbour; it is a fixed, white, dioptric light of the 4th order, visible from N. by W. $\frac{3}{4}$ W. through East to S. by E., standing 100 feet above high water level, and can be seen 14 miles in clear weather.

It is intended to replace this light by a group, occulting, white light, showing groups of 4 occultations every minute.

The column is built of laterite, and is painted white.

Signals are displayed from a yard on the column, just below the lantern.

The light will be exhibited in the near future from another column close to the present site, and the old column will be left as a day mark and signal station.

The best anchorage is about 2 miles from the shore, in 4 to 5 fathoms, very soft mud, with the Lighthouse bearing from E.N.E. to E.S.E. according to the wind and current, during the fine weather.

It is impossible to give any anchorage for the S.W. monsoon, which depends entirely upon the position of the mud bank. A few years ago the best anchorage for Cochin was $5\frac{1}{2}$ miles to the north, at Narrakal, a port in the Cochin State, but the bank has been gradually moving southwards towards Malapuram.

The anchorage is, however, carefully determined by the Port Officer after the first burst of the monsoon, and due notice is given to all shipmasters visiting the port.

The Landing and Shipping Dues' Act has been brought into force in Cochin (1901) and it is proposed to spend about ten lacs of Rupees in dredging the bar, and constructing wharves in the inner harbour. This should have been done years ago, and if only the money is spent wisely, Cochin ought to be one of the finest harbours in India in five years' time.

The port flagstaff has been removed from the Port Office to the foreshore, close to, and 90 feet N. of the Lighthouse.

It is high water, full and change of the moon, at 11 hours 26 minutes (mean establishment of the port), springs rise 3 feet, and neaps $1\frac{1}{2}$ feet.

The tides run with great violence at times during the spring tides through the entrance to the harbour, and strangers should be careful when using the ship's boats.

Pilotage is compulsory for all vessels over 100 tons, and there are two Government Pilots, under the orders of the Port Officer, who are always on the look-out for vessels.

There is 16 feet of water over the bar at high water springs. During the last few years several large steamers, one or two over 2,000 tons register, have been taken into the inner harbour to load down to $15\frac{1}{2}$ feet, and have experienced no difficulty or delay in getting out. As the anchorage inside is quite close to the quay this is a great saving, and a steamer can get good despatch, the cost being trifling.

The channels are properly buoyed.

There are two bar buoys marking the fairway painted according to the uniform system of buoyage in Indian waters.

About half-way between Vypeen Point and the bar buoys another larger buoy is placed, to mark the sand spit on the northern side of the channel.

These buoys are removed from the 15th of May to the middle of September.

Inside the harbour there are several buoys marking the anchorages.

A few large buoys for stern moorings would be very useful here.

The principal exports are coir yarn, rope, fibre and matting, copra, hides, nux vomica, salted fish, coculus indicus, lemon-grass oil, fish oil, cocoanut oil, turmeric, pepper, ginger, coffee, tea, and timber, valued at 80,00,000 Rupees.

The principal imports are rice and paddy, piece goods, hardware, European liquors and stores, petroleum, sugar, metals, cotton twist, opium, wheat, valued at 50,00,000 Rupees.

There are 146 boats belonging to the port of from 12 to 15 tons burthen, with a total capacity of about 2,000 tons.

About 250 boatmen are always available.

Labour is abundant, and the men earn from 6 to 10 Annas a day.

Rice and general cargo costs from $3\frac{1}{2}$ to 5 Annas a ton to work. Heavy and awkward cargo about 12 per cent. more.

The cost of landing and shipping is from 8 to 12 Annas a ton in the fine season, according to the nature of the cargo. In the south-west monsoon about 50 per cent. more.

The Port is under the charge of a Port Officer, who is also Conservator of the Ports at Narrakal and Malapuram.

The chief Customs Officer is the Deputy Collector, and an Assistant Superintendent of Sea Customs is in charge of the office.

The peculiar position of the port, surrounded on all sides by native territory, admits of many opportunities for easy smuggling, in spite of the understanding which exists with the Madras Government.

Cochin has a large foreign and coasting trade, and large shipments of rice and paddy are imported from the Bengal and Burmah rice ports.

A large number of small native owned brigs and schooners, from Chittagong and elsewhere, visit the port annually, and a few European owned sailing ships still call at this port to load for the United States.

All the rest of the foreign trade is in the hands of steamship owners, principally those belonging to the Clan Line and China and Japan steamers, who call here on their way to Europe to fill up.

It is also a regular port of call for the British India and Asiatic Companies' steamers.

Fresh provisions are plentiful and fairly cheap, no stores or coal.

The water is very bad and should not be taken, except when absolutely necessary.

If water is taken, care should be taken to see that it comes from Alwaye, 18 miles up the backwater.

This water can be supplied at the rate of 15 Rupees per boat load of 15 to 20 hogsheads.

There are no dry docks.

There is a good hospital, where European and native seamen are admitted.

Europeans are charged 10 Rupees on entrance and 1 Rupee per diem for food. Native seamen 4 Annas a day.

Medical attendance free of charge. There is no hospital dues on shipping.

Small repairs can be executed at the local workshops, which are under European supervision.

There are no cranes or steam hoists.

No fees are charged for Bills of Health, and there are no foreign consuls.

Fees for ordinary surveys, 30 Rupees, for extraordinary, such as fire, etc., 50 Rupees, for survey of hatches, 20 Rupees. Capt. Winckler is Lloyd's surveyor.

Brokerage for freight or chartering is 4 Annas a ton.

Shipmasters should be careful when chartering their ships to load rice for this port to see that a clause is put in the charter-party, giving a minimum discharge for each working day, instead of the usual clause "according to the custom of the port" which means nothing in Cochin.

Steamers are sometimes detained 20 days discharging a cargo of rice or paddy of 3,000 tons.

Great care is also necessary when tallying out the cargo, as the boatmen are great thieves, and require careful watching.

Cochin Boat Hire Rates.

| | Outer Roads. | | Inner Harbour. | |
|--|--------------|----|----------------|----|
| | Rs. | A. | Rs. | A. |
| Licensed Kettoo Oullum or boats from 3 to 4 tons with cargo, per ton | 2 | 4 | 0 | 12 |
| Ordinary Passenger Boat, water trip per trip | 2 | 0 | 0 | 12 |
| For a load of 20 casks of 50 gallons each including all charges ,, | 15 | 0 | 12 | 12 |

Extraordinary Rates.

| Boats proceeding to vessels beyond 7 fathoms but not outside port limits per trip | Double rates | | | |
|---|--------------|----|----------------|----|
| Boats employed between 8 P.M. and 4 A.M. " | " " | | | |
| | Outer Roads. | | Inner Harbour. | |
| | Rs. | A. | Rs. | A. |
| Boats carrying 6 large pipes of oil or 7 small or 12 puncheons or 20 hogsheads | 2 | 8 | 1 | 0 |
| Boats carrying 50 bales of yarn or fibre or 50 cases of coffee or 12 bales of hides | 3 | 4 | 1 | 0 |
| Boats carrying 100 bags of rice, coffee, pepper, etc. . . per 100 bags | 3 | 12 | 1 | 0 |
| Boats carrying coir, dholls or rolls of coir yarn or coils of coir rope per boat load | 3 | 6 | 1 | 0 |
| One cargo boat loaded with general cargo or passengers . . . | 3 | 8 | 1 | 2 |
| Landing ballast or coal | 0 | 10 | 0 | 5 |
| Transshipping cargo from one vessel to another . . . per trip | 2 | 0 | — | — |
| Transshipping coals or ballast | 0 | 8 | — | — |

Cochin and Malabar Coast Tonnage Scale.

As revised and approved by the Chamber of Commerce.

1900.

| | |
|---|--|
| Arrowroot, in cases | 50 cubic feet. |
| „ bags | 16 cwt. net. |
| Bees' Wax, in cases | 50 cubic feet. |
| „ bags | 16 cwt. net. |
| Betel Nut, in bags or mats | 16 „ |
| Blackwood, in square logs | 50 cubic feet. |
| „ otherwise than in square logs | 20 cwt. net. |
| Bonemeal, in bags | 20 „ |
| Cardamons, in robbins | 10 „ |
| „ bags | 10 „ |
| „ cases | 50 cubic feet. |
| Cassia, in bales | 800 lbs. net. } 50 |
| Cinnamon, in bales | 800 „ „ } c. ft. |
| „ cases | 50 cubic feet. |
| Citronella oil | 50 „ |
| Cocanut oil, in casks | 14 cwt. net. |
| Coculus Indicus, in robbins | 14 „ |
| „ „ bags | 16 „ |
| Coffee, in casks | 16 „ |
| „ bags | 18 „ |
| „ cases | 50 cubic feet. |
| Coir Yarn and Fibre, in pressed bales | 50 „ |
| „ in bundles or coils | 8 cwt. net. |
| „ Dholls not exceeding 4 lbs. | 10 „ |
| Coir Matting, in rolls | { 50 c. ft., 1/4th allowed off for the round. |
| Coir Rope, in coils | 8 cwt. net |
| Coir Junk, in pieces | 12 „ |
| Copprah, in robbins | 10 „ |
| „ pressed bales | 50 cubic feet. |
| „ bulk | 12 cwt. net. |
| „ bags | 12 „ |
| „ bags, each cup cut in 4 pieces | 14 „ |
| Cotton, in pressed bales | 50 cubic feet. |
| Cowries, in bags or cases | 20 cwt. net. |
| Cutch, in cases | 50 cubic feet. |
| „ bags or baskets | { 16 cwt. net, un- screwed. |
| Cinchona, in bales | 50 cubic feet. |
| Elephants' Teeth, in cases | 50 „ |
| „ „ bundles | 18 cwt. net. |
| „ „ loose | 20 „ |

| | |
|---|----------------|
| Fish Oil, in casks | 14 cwt. net. |
| Ginger, in cases | 50 cubic feet. |
| „ bags | 12 cwt. net. |
| „ casks | 8 „ |
| Gingelly Seed, in bags | 20 „ |
| Gums of all kinds, in cases | 50 cubic feet. |
| Hemp, in screwed bales | 50 „ |
| Hides, unpressed | 12 cwt. net. |
| „ (green), unpressed | 20 „ |
| „ (dry), in bales | 50 cubic feet. |
| Horns (Buff and Cow), loose | 16 cwt. net. |
| „ (Deer), loose | 12 „ |
| Lemon Grass Oil, in cases | 50 cubic feet. |
| „ „ drums or tanks | 50 „ |
| Linseed, in bags | 18 cwt. net. |
| Mica, in cases | 50 cubic feet. |
| Myrobalams, in bags | 16 cwt. net. |
| Nux Vomica, in robbins | 14 „ |
| „ bags | 16 „ |
| Nutmegs, in cases | 50 cubic feet. |
| Oil Seeds, in bags | 17 cwt. net. |
| Other Oil, in tanks, cases or drums | 50 cubic feet. |
| Pepper, in bags | 16 cwt. net. |
| „ robbins | 14 „ |
| Plumbago, in bags or barrels | 20 „ |
| Poonac, bundles or bales | 20 „ |
| Rice, in bags | 20 „ |
| Saltpetre, in bags | 20 „ |
| Sandal and Sapan Wood, in bags | 13 „ |
| Sandalwood Roots, in bags or bundles | 13 „ |
| „ „ loose | 13 „ |
| Sugar, in bags | 20 „ |
| Tallow, in casks and cases | 18 „ |
| Tea, in chests | 50 cubic feet. |
| Timber (all kinds), square logs or planks | 50 „ |
| „ round logs | 50 „ |
| „ otherwise | 20 cwt. net. |
| Turmeric, in bags | 14 „ |
| Wheat, in bags | 20 „ |
| „ morahs | 18 „ |

Coir, Junk, Horns, Oil Breakers, Hides (loose) and all packages not exceeding 56 lbs. gross to be taken as Broken Stowage, at half freight.

All goods shipped by measurement to be measured before shipment, and the cubic contents entered on the face of the Bill of Lading. In measuring, the Callipers are to take in the rope or iron on the one side of the bale and leave it out on the other, half inch to be given and taken alternately; and that in any cases of dispute as to the measurement, the Master Attendant be requested to measure the disputed package; and that his decision shall be considered final. The party found to be in error shall pay a fee of 15 Rupees.

Scale of Pilotage Fees at the Port of Cochin.

(Government Notification, Fort St. George Gazette, 6th March, 1877.)

I.—For every vessel of any burden exceeding 100 tons, but not exceeding 200 tons—

| | | | | | | Per foot. | | |
|-----|---|---|---|---|---|-----------|-----|----|
| | | | | | | Rs. | As. | P. |
| (a) | Drawing 4 feet and over 3 feet of water | . | . | . | . | 0 | 10 | 0 |
| (b) | " 5 " 4 " | . | . | . | . | 0 | 11 | 0 |
| (c) | " 6 " 5 " | . | . | . | . | 0 | 13 | 0 |
| (d) | " 7 " 6 " | . | . | . | . | 0 | 15 | 0 |
| (e) | " 8 " 7 " | . | . | . | . | 1 | 4 | 0 |
| (f) | " 9 " 8 " | . | . | . | . | 1 | 9 | 0 |
| (g) | " 10 " 9 " | . | . | . | . | 1 | 14 | 0 |
| (h) | " 11 " 10 " | . | . | . | . | 2 | 8 | 0 |
| (i) | " 12 " 11 " | . | . | . | . | 3 | 2 | 0 |
| (j) | " 13 " 12 " | . | . | . | . | 3 | 12 | 0 |

(The draught of water will be calculated upon a whole foot, *e.g.*, a vessel drawing $3\frac{1}{2}$ feet will be charged at 4 feet, or 2 Rupees 8 Annas, and one drawing less than $3\frac{1}{2}$ feet, at 3 feet, or 1 Rupee 14 Annas.)

II.—(a) For every vessel whose burden exceeds 200 tons, but does not exceed 400 tons Rs. 30

(b) For every vessel whose burden exceeds 400 tons, but does not exceed 600 tons 40

(c) For every vessel whose burden exceeds 600 tons 50

There is a flagstaff at the little port of Malapuram, close to the salt golahs, with a clear view from seaward from South round to N.W. in Latitude $10^{\circ} 01' 07''$ N. and Longitude $76^{\circ} 16' 05''$ E.

Narrakal is a town and port in the Cochin Native State, which owes its importance to a so-called mud bank.

This mud flat extends nearly to Cochin, and in the stormiest weather vessels can lie here at single anchor in safety. The sea is calm, and there is no surf on the beach. The best anchorage is given to shipmasters every year after the burst of the monsoon. For the last four years, however, it has only been used as a port of safety, as the boats cannot land their cargo on the beach, the mud bank having extended nearly two miles from the sandy beach, and dries at low water. The mud is so soft it will not bear a man's weight.

The Cochin Government built a pier here some years ago, but the sea has receded and left it high and dry.

An obelisk, 25 feet high, white with black band, has been erected about one mile South of Narrakal in Latitude $10^{\circ} 2' N.$, Longitude $76^{\circ} 13' E.$

The Light, in Latitude $10^{\circ} 3' N.$, Longitude $76^{\circ} 12' E.$, is situated on the beach at the mouth of a creek, 5 miles North of

Cochin. It is a fixed, white light, illuminating an arc of 180° from *N.N.W.* through East to *S.S.E.*, standing 95 feet above high water level, and visible 10 miles in clear weather. The lantern is on a platform on the flagstaff, and the light is exhibited only from 15th May to 30th September during the south-west monsoon.

The coast between Cochin and Beypore is low and sandy, fringed with cocoanut trees, and wholly devoid of any conspicuous landmarks,

Ponani. Latitude $10^\circ 47' 10''$ N., Longitude $75^\circ 57' 55''$ E., is a busy seaport for native craft, and the most important between Cochin and Beypore. It also possesses water communication with Cochin and Travancore, and is connected at Tirur with the Madras Railway.

It is the centre of Muhammedan education on the West Coast, and possesses a kind of religious college.

When Colonel Hartley made his descent on this coast in 1790 the people of Ponani gave in their adhesion readily.

The best anchorage is about $\frac{3}{4}$ of a mile from the bar, in $4\frac{1}{2}$ to 5 fathoms, with the flagstaff bearing from *N.* 78° *E.* to *N.* 60° *E.* magnetic, with the river entrance open. The bottom is all mud.

Large native craft can enter the river, as there is 13 feet of water on the bar at high water spring tides.

There are three unlicensed pilots always on the look-out.

The principal exports are timber, bamboos, cocoanuts, fibre, coir yarn, and copra, and the imports are rice and paddy, salt, petroleum, and ordinary bazaar cargo.

The British India and Asiatic Companies' steamers call here occasionally in the fine season.

There are 20 boats with a total capacity of 300 tons.

Boatmen and coolies are always available and inexpensive.

The cost of working cargo is 4 Annas a ton, and landing and shipping costs from 8 to 12 Annas a ton.

The port is in charge of a Customs official, subordinate to the Port Officer of Cochin.

The port is closed during the south-west monsoon.

There are several small ports between this and Beypore, but as they are only used by small native craft they call for no further mention in this book.

Beypore. Latitude $11^\circ 10'$ N., Longitude $75^\circ 50' 30''$ E., is a port close to and subordinate to Calicut, situated at the mouth of the Beypore River, called by the natives Pauna-puya, or Gold River.

Although many attempts have been made to utilise the natural advantages of its position, it has never become a very important port, and when the Madras Railway was extended to Calicut the trade declined still further.

It is, however, still an occasional port of call for both coasting and foreign steamers and native craft.

Large quantities of timber and bamboos are floated down the river for exportation.

There are also some shipments of coffee from the Ochterlony Valley and S.E. Wynaad Estates.

Small native craft can go inside the river.

The best anchorage for steamers is close to the large spar buoy painted white, which lies in 23 feet of water lowest spring tides, with the following bearings :—

| | | |
|--------------------------|-----------------------------|-------------|
| Bey pore Flagstaff | N.E. by E. $\frac{1}{2}$ E. | } Magnetic. |
| Northern Boundary Pillar | N. by E. $\frac{1}{2}$ E. | |
| Tree on Kottacoon Hill | E. by S. | |

Steamers should not come inside this buoy, which is removed during the south-west monsoon.

It is high water, full and change of the moon, at 11 hours 16 minutes; spring tides rise 5 feet, neaps 4 feet.

There are a few boats belonging to the port, but both boats and labourers come from Calicut, when there are large shipments.

For further trade remarks, see Calicut.

The port is under the charge of a Conservator, who is subordinate to the Port Officer of Calicut.

Steamers coasting between Bey pore and Calicut should not approach the coast under $5\frac{1}{2}$ fathoms.

Calicut (“koli-kukkugu,” “cock crowing,” or “koli-kotta,” “cock fort,”) is the principal fort and town in Malabar, and its foundation is ascribed to Chereman Perumal, the lord of Malabar, whose conversion to Islam and departure for Mecca figures so prominently in the legends of the country. Calicut was granted by him to the Zamorin.

The present town dates from the 13th century, and has given its name to the cloth known to the Portuguese as calicute, or to the English as calico.

The Zamorins rose to very great power, and built many magnificent buildings.

The Moplahs are the descendants of Arabs, half Arab, half Hindu.

According to their own tradition, there were originally only 13 Arabs, from whom they sprang, who settled at Cháliyam, on the Beypore River.

Calicut is celebrated as being the first port in India visited by Europeans.

The Portuguese adventurers, under Covilham, landed in 1486 and painted the country in such glowing terms when they returned to Portugal that a fleet was fitted out, and Vasco da Gama arrived at Calicut in 1498, but was not well received by the Zamorin.

In 1501, however, a factory was established, which was burned down by the Moplahs, and the whole colony cruelly murdered.

Nine years later Albuquerque arrived, and burnt down the Zamorin's palace, and destroyed a portion of the town, in revenge for the murder of his countrymen.

The French settlement dates from 1722. Since that date it has been three times in British possession, but was finally restored in 1817.

The Danish Government established a factory in 1752.

The first British settlement dates from 1616.

In 1695, Captain Kidd, the pirate, ravaged the port, and in 1766, 1773 and 1788 the town was pillaged by the troops belonging to Haidar Ali and Tipu. In 1790, however, the British occupied the town, and the East India Company acquired sovereign rights, under the treaty of Seringapatam, in 1799.

The houses on Conolly's Hill are a good land-mark from seaward. They are about 200 feet high.

The Camel's Hump is very conspicuous and bears *N.E.* by *E.* $\frac{1}{2}$ *E.* from Calicut Lighthouse, and is 7,000 feet above sea level.

The best anchorage is close to the Pillar buoy (black), which marks the southern and eastern limits of the anchorage, and is moored in 24 feet lowest spring tides, on the following bearings:—

| | | |
|-------------------------------|---|-------------|
| Conolly's Hill (highest tree) | <i>N.</i> $36\frac{1}{2}^{\circ}$ <i>E.</i> | } magnetic. |
| Pier Head | <i>N.</i> 73° <i>E.</i> | |
| Lighthouse | <i>S.</i> 89° <i>E.</i> | |

Care should be taken that this buoy is not mistaken for the Coote Reef buoy (red), which lies in 21 feet, with Conolly's Hill bearing *N.* $\frac{3}{4}$ *E.* magnetic, and the Lighthouse bearing *N.E.* by *N.*

Steamers anchoring to the southward of the Pillar buoy should be careful not to bring it to bear to the westward of north, as there are dangerous patches of foul ground inside that bearing.

The shore may be approached with safety in the fine season to the north of the Pillar buoy, or inside of it, in a line with the Pier end on; but on no account should vessels drawing more than 9 or 10 feet anchor inside the buoy, with the south side of the pier open.

Gilham Rock lies *S. $\frac{1}{4}$ W.*, 2 miles from the Lighthouse, and $\frac{1}{2}$ a mile from the beach.

Calicut Reefs, least water 14 feet, are *N.E. by E. $\frac{1}{4}$ E.*, $1\frac{1}{2}$ miles from the Lighthouse, and extend $1\frac{1}{2}$ miles in a southerly direction to abreast Gilham Rock.

Reliance Shoal is $3\frac{1}{2}$ miles from the Lighthouse, in a *W. by N.* direction, and about $1\frac{1}{2}$ miles *N.W.* of the steamer anchorage.

It is about $2\frac{1}{2}$ miles long, and $\frac{1}{2}$ mile broad, with $4\frac{3}{4}$ to $6\frac{1}{2}$ fathoms of water on it. The bottom is rock with soft mud close to all round it.

Anchorage Reef, with 13 to 16 feet water, lies $\frac{3}{4}$ of a mile north of Calicut Reef, with the Lighthouse bearing *E. $\frac{1}{4}$ N.*

The Light, in Latitude $11^{\circ} 15' 5''$ N., Longitude $75^{\circ} 45' 35''$ E., is situated near the beach. It is a fixed, white, dioptric light of the 4th order, visible in clear weather 14 miles, between the bearings of *N. 25° W.* through East to *S. 14° E.*

The Lighthouse is built of stone, painted white, and the light is 102 feet above high water.

There is also a small red light on the end of the pier, to guide the small native craft into the roadstead.

Boat Hire Rates for Calicut, Badagara, Tellicherry, Cannanore, Beypore, and all Malabar Ports.

Between sunrise and 8 p.m.

| | | Rs. | As. | P. |
|--|------------------------------------|-----|-----|----|
| Boats capable of carrying 1 ton and under, whether laden or unladen— | | | | |
| From the beach to vessels—under 3 fathoms at all ports . | per trip | 0 | 6 | 0 |
| From the pier at Calicut to vessels—in 3 fathoms and under . | „ | 0 | 4 | 0 |
| From the beach to vessels—in 3 fathoms and under 5 fathoms | „ | 0 | 14 | 0 |
| From the beach to vessels—in 5 fathoms and under 7 fathoms | „ | 1 | 8 | 0 |
| From the beach to vessels—beyond 7 fathoms . | per trip . According to agreement. | | | |

Return trip from vessels in 3 fathoms and not over 7 fathoms —

| | |
|-----------------------------------|-------------------------|
| From the same vessel | Half the ordinary rate. |
| From a different vessel | Full ordinary rates. |

Transshipping between vessels in 3 fathoms and not over 7 fathoms —

| | |
|--|-------------------------------|
| For the first trip, in addition to the ordinary hire | Two-thirds the ordinary rate. |
| For each succeeding trip | Half the ordinary rate. |

Water trip to vessels in 3 fathoms and not over 7 fathoms —

12 Annas per hogshead, in addition to the ordinary rate to vessels beyond 7 fathoms, according to agreement.

Extraordinary Rates.

| | |
|--|---------------------------------------|
| Boats with an awning, per trip | 4 Annas in addition to ordinary rate. |
| Boats employed between 8 P.M. and 4 A.M. | Double hire. |
| Between 4 A.M. and sunrise | One and a-half the ordinary hire. |

In cases of extraordinary service, as proceeding to a vessel in distress within the limits of the Port, the Port Officer shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

The port boundary pillars at Calicut have been altered as follows —

Northern pillar has been moved about $2\frac{1}{10}$ miles to the northward of the Lighthouse, and now stands situated with the Temple, southward of the rifle range, bearing *S. 76° E.*, distant 2 cables, and west extremity of rocky islet *N. 37° W.* Southern boundary pillar is situated about $17\frac{1}{2}$ cables southward of the Lighthouse, with large flat tree bearing *N. 76° E.*, distant $3\frac{3}{4}$ cables, and Calicut Lighthouse *N. 16° W.*

There is a very large native coasting trade, and hundreds of native craft of all rigs and sizes may be seen here during the fine season.

It is also a regular port of call for the British India and Asiatic Companies' steamers.

The foreign trade is considerable, and many large steamers, principally belonging to the Clan Line, load for the United Kingdom and the Continent.

The port is under the charge of a Port Officer.

The Collector of the District is the chief customs authority, and the office is under the charge of an Assistant Superintendent of Sea Customs.

There is a fine iron screw pile pier, 524 feet long, on which there are three cranes for lifting cargo.

Cargo is also landed and shipped on the beach.

Calicut is at present the south-west terminus of the Madras Railway, but an extension to Cannanore is now under construction.

Varakal has now been included within the limits of the port.

There is a mud bank abreast of the village, in consequence of which cargo can be landed and shipped when it is impossible for a vessel to work at the Calicut anchorage.

It is high water, full and change, at 11 hours 13 minutes ; spring tides rise 5 feet, neaps 4 feet.

The principal exports are coffee, cinnamon, pepper, cardamoms, ginger, coir yarn, copra, timber, wax, sandalwood, salted fish, cotton, poonac, etc., valued at 12,600,000 Rupees.

The imports are principally twist, yarn, piecegoods, dates, rice and paddy, gunny bags, salt, petroleum, metals, sugar, tobacco, and European stores and liquors, valued at 8,500,000 Rupees.

There are 165 boats belonging to the port, representing about 3,000 tons.

Boatmen and labourers are abundant, and labour is inexpensive.

The cost of working cargo is from $3\frac{1}{2}$ to 6 Annas a ton, and landing and shipping costs from 8 to 14 Annas a ton, according to the season and the nature of the cargo.

Fresh water and provisions are procurable.

European and native seamen are admitted into the hospital. There are no hospital dues on shipping.

The port is practically closed from the beginning of June to the end of August.

Quilandi is a small seaport about 10 miles north of Calicut, with considerable native trade. The roadstead is protected by a mud bank and is consequently more secure than most anchorages on the coast.

It was close to this port that Vasco da Gama's fleet first anchored in 1498, and one of the East India Company's ships was lost near here in the south-west monsoon of 1793.

Close to the port is a celebrated mosque, recently restored, established by Malik Ibn Danur.

On a rock on the seashore, $1\frac{1}{2}$ miles North of Quilandi, there is a deeply cut footprint chiseled out of a natural hollow, $3\frac{1}{4}$ feet long by 11 feet broad. It is said to be the print of Adam's foot as he landed from across the ocean ; his next step taking him to Adam's Peak in Ceylon.

Sacrifice Rock is a remarkable islet, 20 miles *N.W.* from Calicut Lighthouse, and 6 miles *W.* by *N.* $\frac{1}{2}$ *N.* from Cotta Point. It is composed of granite, 58 feet above high water level, and of a white appearance, being covered with bird's dung. A Lighthouse will be erected by the Madras Government on the Rock in the near future.

It is in Latitude $11^{\circ} 29' 45''$ *N.*, Longitude $75^{\circ} 31' 30''$ *E.* and is steep to on all sides, with 13 fathoms close alongside, and 15 fathoms 2 miles off to seaward.

Tikkodi Point is a low rocky point, off which rocks, dry at low water, extend some distance. The western extreme of the reef of the same name bears *W.* by *N.* $1\frac{1}{4}$ miles from Cotta Point, and has depths of 8 to 16 feet on it.

There is a safe channel for steamers between this reef and Sacrifice Rock, but a vessel using it should borrow towards the rock and not shoal under 7 fathoms towards the reef.

Badagara, or ("Vadaka kara," the "North Bank") is a port of some importance, and is an occasional port of call for the British India coasting steamers. It is open to foreign export trade.

The flagstaff is in Latitude $11^{\circ} 36'$ *N.*, Longitude $75^{\circ} 37' 15''$ *E.*

The best anchorage is about $1\frac{3}{4}$ miles from the shore, in $4\frac{1}{2}$ to 5 fathoms, mud, with the flagstaff bearing from *E.* by *N.* to *E.* by *S.*, according to the wind and current.

The old fort, which was retaken from Tipu in 1790, was restored to the family of the Kadattanad Raja.

The Calicut-Cannanore Railway, which is under construction, will pass through this town.

The principal exports are copra, pepper, and cocoanuts, valued at 1,451,000 Rupees.

The imports are principally rice and paddy and salt, valued 1,000,000 Rupees.

There are only 24 boats, with a total capacity of 183 tons, and both boatmen and labour are insufficient for the requirements of the port. Whenever steamers have large tonnage to land or ship, both boats and men have to be sent from Tellicherry, 15 miles away.

The cost of working cargo is about 4 Annas a ton in the fine season.

Landing and shipping, by contract, costs about 9 Annas a ton in the fine season, and double during the monsoon months.

The port is under the charge of the Port Officer of Tellicherry. An Assistant Superintendent of Sea Customs is in charge of the Office.

There is a branch civil hospital, where seamen are admitted.

Mahé ("a Fish") is a French settlement in Latitude $11^{\circ} 42' 10''$ N., Longitude $75^{\circ} 31' 10''$ E. There is a good inside harbour, which admits small native craft over its rocky bar.

The French first settled here in 1722, since that date it has been taken three times by the British, but was finally restored in 1817. As a port it is of very little importance; the exports are salted fish and cocoanuts, and the imports wines and spirits and rice.

It is a coaling station for the French Government, and it is occasionally visited by a man-of-war.

The Governor resides here.

The best anchorage is in $4\frac{1}{2}$ fathoms, mud, about 2 miles from the shore, with the flagstaff bearing N. 68° E. magnetic.

The Light is situated on the southern side of the entrance to the river, close to the flagstaff. It is a red, fixed light, illuminating an arc of 360° , and exhibited from a small pyramid, standing 52 feet above high water level. The light is visible 7 miles in clear weather, and is shown only during the north-east monsoon.

Kallai is a British Port on the northern side of the Mahé River, and the Custom House is about $\frac{1}{4}$ of a mile up the river, above the bridge. There is a considerable native trade, and a large boat building and repairing yards.

The principal export is timber, principally to Cutch and ports on the Kattiwar coast.

Great quantities of cocoanuts are also shipped here annually.

The imports are principally rice and paddy. A Customs' Official is in charge of the port.

Tellicherry is a very picturesque town, built on a group of wooded hills running down to the sea, and protected by a natural breakwater of rocks.

The fort is in excellent preservation; it was built by the English in 1708, and is still kept up by Government. It is built of laterite in the form of a square, with bastions on the S.E. and N.W. corners. There is also another larger bastion to the northward, built on the cliff overhanging the sea, and separated from the main work. A large house was built here by a former Port Officer, and is now the

residence of the Sub-Collector. Inside the fort there are several Government Offices, and the Lighthouse tower is on the *N.W.* bastion. There are two quaint old figures of the soldiers of the period over the eastern gateway.

Tellicherry is not, as some suppose, a place of ancient trade. It was, however, the centre of the East India Company's pepper trade, but was subordinate to the Company's Bombay Settlement in 1683.

Haidar Ali's invasion of Malabar interfered with and ruined the trade, and in 1766 the factory was reduced to a mere residence.

From 1780 to 1782 the town was besieged by Haidar Ali's troops, and the numerous remains of redoubts on the various hills surrounding the town give evidence of the resistance that was successfully offered to the invaders.

Tellicherry was finally ceded to the British in 1792.

The Port and Customs Offices are in the centre of the town close to the new Port Flagstaff, the old staff in the fort having been pulled down.

The sea has of late years encroached on the town, and has done much serious damage to the house property near the beach, and has confined the space for landing and shipping operations. A sea wall was built opposite the Custom House in 1896, and similar walls will have to be built to preserve the town from still further destruction.

The landing place is protected by a mud bank, in addition to the natural breakwater already mentioned, in consequence of which steamers can often have communication with this port when all the others on this coast are closed.

The breakwater lies $\frac{1}{2}$ a mile *S.W.* of the town, and is composed of basalt rocks lying parallel with the coast, the westernmost rock, named Bilikulu, is 20 feet high, and a $\frac{1}{4}$ of a mile long *N.W.* and *S.E.* There are also many detached rocks, above and below water, between this and the main, and the bottom is all more or less foul with small channels, known to the boatmen, between the rocks. They afford good shelter during the south-west monsoon.

The Kodavuli and Anjerakandi Rivers enter the sea about a mile to the north of Tellicherry.

The entrance has the usual sand bar, on which the sea always breaks.

The river is used by the boatmen for laying up and repairing their boats during the south-west monsoon.

It is a regular port of call for the British India and Asiatic coasting steamers, and during the season chartered vessels, principally Clan Line, load here for the United Kingdom and Continent.

The Calicut-Cannanore Railway will pass through Tellicherry, and the Chamber of Commerce has urged upon Government the necessity of a line from the coffee growing districts, which it is hoped will be constructed in due time.

There is a weekly mail to Europe *viâ* Madras, and telegraph to all parts of the world.

There is a very large pepper trade, but the coffee exports have declined somewhat owing to the keen competition at Mangalore.

The principal exports are coffee, pepper, copra, sandalwood, cardamoms, cocoanuts, salted fish, etc., valued at 8,350,000 Rupees.

The imports are principally rice, paddy, salt, petroleum, sugar, grains, cotton twist, metals, liquor and stores, piece-goods and the ordinary bazaar cargo, etc., valued at 4,300,000 Rupees.

It is high water, full and change of the moon, at 11 hours 20 minutes; springs rise 5 feet, neaps $3\frac{1}{4}$ feet.

The best anchorage is in 4 to 5 fathoms, soft mud, on the following bearings, about 1 mile from the rocks:—

| | |
|-------------------------------------|-------------|
| Lighthouse bearing <i>N. 38° E.</i> | } magnetic. |
| Green Island „ <i>N. 21° W.</i> | |
| Flagstaff „ <i>N. 42° E.</i> | |

During the prevalence of north-west winds vessels should anchor about one mile further to the *S.E.*; this is, however, just outside port limits.

| | |
|---|---|
| Lighthouse bearing <i>N. $\frac{1}{2}$° E.</i> | } $4\frac{1}{2}$ to 5 fathoms, L.W.S.T. |
| Nilot Point „ <i>N.E. $\frac{1}{4}$ N.</i> | |

The Light, in Latitude $11^{\circ} 44' 50''$ *N.*, Longitude $75^{\circ} 28' 30''$ *E.*, is situated on the fort wall, near the beach. It is a fixed, white, dioptric port light, of the 6th order, standing 70 feet above high water level, and visible 6 to 8 miles in clear weather, between the bearings of *N.W.* through East to *S.E.*

The column is square, built of laterite, and painted white.

Good water and provisions of all sorts are plentiful and cheap. No stores or coal.

There is a good hospital and civil dispensary. Both European and native seamen can be treated free of charge.

There are 57 cargo boats of all sizes, with a total capacity of 600 tons, and 300 boatmen are always available.

Labour is abundant and reasonable, and the men are excellent workers, quite reliable, and give no trouble.

The cost of working cargo is from 3 to 5 Annas a ton, landing and shipping, by contract, costs 8 to 9 Annas a ton in the fine season, the Government rates being 14 Annas a ton, and double rates during the south-west monsoon.

The port is under the charge of a Port Officer, who is also in charge of the ports of Badagara and Cannanore.

The Customs Office is under the charge of a Superintendent of Sea Customs.

The weather is uncertain from the end of May to the beginning of September, but it is very rarely a steamer has to pass this port on account of the weather.

Green Island is $2\frac{1}{2}$ miles N.W. by W. $\frac{1}{2}$ W. from Tellicherry Lighthouse, and $\frac{1}{10}$ of a mile from Dharmapatam Island, which is practically part of the mainland. The island is 66 feet above sea level, and is covered with cocoanut trees. It is surrounded with rocks, and there are numerous detached rocks between this island and the Tellicherry Rocks.

Steamers coasting between the anchorages of Tellicherry and Cannanore should not approach the land under 5 fathoms.

Cannanore is the largest military station on the Malabar Coast, and was formerly of great importance, there is now only one company of European infantry and one native regiment.

The town is kept clean, but has a deserted appearance.

The fort, which is now only used as an ordnance store, is in very good preservation, and is kept in repair by Government, and there are several guns mounted on the ramparts.

In 1498 Vasco da Gama landed here, and being well received by the Raja, a colony was planted, and in 1505 a factory was erected, on the site of which a Roman Catholic Chapel now stands at the fishing village of Thai.

Fort St. Angelo was built by the Portuguese on the promontory, and the present fort was built by the Dutch in 1656, but fell into the hands of the Mysore troops in 1766.

In 1784 Cannanore was captured by the British, and the reigning Bebe became tributary to the English Company.

It was again taken in 1791, since which time it has remained in the hands of the British.

There are some very curious old buildings in the bight of the bay, where the descendants of the old Arab Sea Kings reside, and there are also two mosques of special fame.

The Custom House is on the beach and close to the landing place.

The Flagstaff is close to the Lighthouse in the fort; storm signals are displayed during bad weather.

A large steamer should anchor in 5 fathoms, soft mud, with the Lighthouse bearing *N.E.* by *N.* magnetic.

For light draught steamers a good anchorage will be found in 23 feet, mud, on the following bearings:—

| | |
|--|-------------|
| Flagstaff <i>N.</i> 4° <i>E.</i> | } magnetic. |
| South Boundary Pillar <i>S.</i> 85° <i>E.</i> | |

It is high water full and change, at 11 hours 20 minutes; springs rise $4\frac{1}{2}$ feet, neaps $3\frac{1}{4}$ feet.

The Light, in Latitude $11^{\circ} 51' 10''$ *N.* Longitude $75^{\circ} 21' 45''$ *E.* is situated on the fort rampart near the beach. It is a fixed, red, dioptric port light of the 6th order, standing 64 feet above high water level, and visible 6 to 8 miles in clear weather between the bearings of *N.* 59° *W.* through East to *S.* 70° *E.*

The principal exports are coffee, pepper, copra, sandalwood, cardamoms, timber, and salted fish, valued at 1,100,000 Rupees.

The imports are principally rice and paddy, piece goods, twist and yarn, dates and military stores, valued at 2,150,000 Rupees.

Good water and provisions of all sorts are plentiful and cheap. No stores or coal.

There is a good hospital, and both European and native seamen are admitted.

The Conservator is subordinate to the Port Officer of Tellicherry, and is also the Customs' Official.

Labour is plentiful and inexpensive, and there are 250 boatmen always available in the working season.

There are 55 licensed boats, representing 300 tons.

The cost of working cargo during the fine season is about 5 Annas a ton, and landing and shipping costs from 9 to 11 Annas a ton by contract, the ordinary rates being higher.

The port is practically closed from the middle of June to the end of August.

It is a regular port of call for the British India and Asiatic coasting steamers, but there is little or no foreign trade.

Troops are landed and embarked here in the fine season, for which purpose a substantial pier has been erected.

The Calicut-Cannanore extension to the Madras Railway is now an accomplished fact, and the extension to Mangalore is under construction.

Beliapatam, or in Malayalam, "Big Town," is in Latitude $11^{\circ} 55' N.$, Longitude $75^{\circ} 25' E.$, and is situated on the left bank of the river, about 4 miles from its mouth. It possesses a thriving trade, and great quantities of timber are exported to Bombay, Surat, and elsewhere.

In 1735 the East India Company built a fort named Madakkara, by permission of the Chirakkal Raja, and Haidar Ali, in his first descent upon Malabar, gained a great victory close to Beliapatam.

There is a very sacred mosque to the *S.E.* of the town, which is believed to have been founded by Malik Ibn Dinar in the 9th century.

The anchorage is abreast of the entrance to the river, about $\frac{1}{2}$ a mile outside the bar, in $3\frac{1}{2}$ to 5 fathoms as convenient. The bottom is sand and mud and good holding ground.

The port is occasionally visited by the British India coasting steamers to load timber, and paddy is imported in large quantities by country craft.

The port is subordinate to Cannanore, and during the working season a clerk from there is in charge of the Customs Office.

The bar is $\frac{3}{4}$ of a mile from the shore, and has 8 feet of water on it at lowest spring tides, but as the channel is frequently changing it is necessary to take a pilot.

There are three unlicensed pilots always on the look-out for vessels.

Native craft lie alongside the bank of the river to unload, and the timber is floated down the river in large quantities.

The river, which was spanned by the Iriti bridge in 1882, is navigable for many miles, and there is also communication by water with Hosdrug in South Canara.

The Government have extended the Madras Railway to this port, and as it has many natural advantages it may in time become an important place.



MOUNT DILLY.

The exports are valued at 400,000 Rupees, and the imports at 800,000 Rupees.

There are only 9 licensed boats, with a total capacity of 26 tons.

Mount Dilli. The correct name is D'Ely (Monte d'Ely of the Portuguese), representing the name of the ancient Malabar state of Eli or Hely, belonging to the Kolatirri Rajas, one of whose seats is close to this hill on the south-east. It is 800 feet high, and situated on the coast with creeks on either side, which joining make it an island.

It is in Latitude $12^{\circ} 2' N.$, Longitude $75^{\circ} 12' E.$

The fortifications, now in ruins, have been occupied in turn by Dutch, French, and English troops.

It is a most excellent land-mark, and can be seen 80 miles from a steamer's bridge, and being steep to may be passed close to with safety.

It is said to be the first land sighted by Vasco da Gama in the 15th century.

In the jungle covering the hill there are hundreds of large monkeys, and there is said to be larger game there also.

Many years ago a project was set on foot for the construction of a harbour to leeward of the headland, but it was abandoned as the cost was prohibitive.

It is a favourite resort for wind-bound native craft, and they may be seen here in large numbers from the end of March to the beginning of the monsoon.

Kavoi is the most northern port in the Malabar District, in Latitude $10^{\circ} 56' N.$, Longitude $75^{\circ} 58' E.$ It is situated on an island, a few miles North of Mount Dilli. There is a ruined French redoubt here. It is only used by small native craft. The anchorage is abreast the Custom House.

Hosdrug, also called Pudia-kot, or New Fort, in Latitude $12^{\circ} 18' 29'' N.$, Longitude $75^{\circ} 9' 15'' E.$, is the southernmost customs port in South Canara, and is subordinate to the port of Kasaragode.

It is only used by native craft. There are ruins of a magnificent old fort close to the town, about 2 miles from the landing place.

It was built by the Ikkeri Rajas, and is still in fair preservation, some of the bastions are circular instead of square, as is usually found in native built fortifications.

Bekal, in Latitude $12^{\circ} 23' N.$, Longitude $75^{\circ} 1' E.$, is another small port, and open roadstead, used by native craft, and is subordinate to Kasaragode.

It is situated in a small bay, with an old fort to the South, on a rocky promontory, and a rocky point to the North, with a long reef of rocks, extending out into 4 fathoms of water.

The fort is large, and well preserved, and the fortifications bear traces of European science.

It was erected in 1625, by Sivappa Naik, during the wars between the Ikkeri and Cherakal Rajas. Haidar Ali captured it in 1763, and the English troops took possession of it in 1799.

Kasaragode is a small river port in Latitude $12^{\circ} 29' 50'' N.$, Longitude $75^{\circ} 2' 10'' E.$

It is situated at the entrance of the Chendragiri River, between the two forts of Chendragiri and Kasaragode, which were built by the Ikkeri Rajas. It was the southernmost post of the ancient Tuluva kingdom.

The principal trade is in timber and firewood. The port is under the charge of a Superintendent of Sea Customs.

The bar is dry at low water, and as the entrance changes nearly every year, the river can only be used by small native craft.

Kumbla, 7 miles North of Kasaragode, is a small customs port, situated on a lagoon, and separated from the sea by a long sand-spit.

The present landing place is over a mile from the Customs Office, but the opening changes nearly every year during the floods in the south-west monsoon.

The port is only used by small native craft, trading between Malabar and South Canara.

There is a magnificent old fort here in very good preservation, and occupying a commanding position. It was built by the Ikkeri Rajas in the early part of the 17th century.

Manjeshwar ("mancha," "bedstead," "Ishwara," "Lord") is a small customs port with little or no trade, 12 miles south of Mangalore, and is situated at the mouth of a small river.

The place was plundered by Angria, the pirate, in 1755.

The port is under the charge of a Sea Customs Superintendent.

Mangalore. The name perhaps is derived from the temple of Mangala Devi, to the south-east of the Town, or the word Mangala "Fortunate."

The natives call it Kodiyal, and the port Kodiyal Bandar.

The town is very picturesque from seaward, and is clean and prosperous. The native part of the town is completely hidden among groves of cocoanut palms.

The port is situated on the backwater formed by the Gurpur and Netravati Rivers.

Mangalore is said to have been the seat of one of the four Brahmin Governors in the 8th century, and of a Wodear, appointed by Harihara Raja of Vijayanagar, in 1336.

It was visited by Ibn Batutu in 1342, and Barbosa describes it as a very fine town, with many rich merchants, in 1514.

Vasco da Gama blockaded the river in 1524, and the town was taken by the Portuguese two years later.

The Portuguese established a factory at Mangalore in 1670, which was, however, burnt down by the Arabs in 1695.

Another Portuguese factory was established in 1714, and the fort of Mangalore, which is now in ruins, was built by the Ikkeri Rajas in 1750.

Haidar Ali captured the town ten years later, and made it the head quarters of his navy.

In 1768, the English captured the town, but abandoned it shortly afterwards and again took possession in 1791, and retained it till 1793, when Tipu besieged it, and the English after a heroic defence were obliged to surrender on the 30th January, 1794. The fort was then demolished by the order of Tipu Sultan.

Mangalore was finally ceded to the British under the treaty of Seringapatam five years later.

The town was entered, and the public offices burnt by the Gaudas during the Coorg insurrection in 1837.

The Roman Catholics have built some very fine churches and colleges, one of which is a conspicuous object from seaward.

The Basel Evangelical Mission have their head-quarters here, and have done much good in teaching the people different trades.

The principal industries are the making of bricks and tiles, cloth weaving, and coffee curing.

The principal objects when approaching Mangalore from seaward are the Kudre Mukh, 6,223 feet above sea level, and 30 miles *N.E.* by *E.* from the town. There are two bungalows built on the eastern

slope, about 200 feet from the top, and it is a favourite resort for Europeans in the hot weather.

The Roman Catholic College of Saint Aloysius, the old Mangalore Lighthouse tower, and a tall factory chimney are all good land-marks. The latter can be seen 18 miles in clear weather.

Barn Hill, 1,000 feet high, bears *S.E.* from the anchorage; and the Asses Ears, 1,100 feet high, bear *N.E.*, distant 17 miles.

Large native craft and small light draft steamers can enter the river, as there is 15 feet of water on the bar at high water ordinary spring tides.

Brigs and schooners from Tuticorin and elsewhere, and many Arabian bugalas, and large kotias from Cutch, some of which are over 200 tons, anchor inside the bar, and hundreds of native craft of all sizes may be seen in the river during the working season.

The Light, in Latitude $12^{\circ} 50' 45''$ *N.*, Longitude $74^{\circ} 49' 30''$ *E.*, is situated on the southern part of the Marine Yard.

It is a fixed, white, dioptric light of the 4th order, standing 33 feet above high water level, and visible 11 miles in clear weather. The old Lighthouse tower at the back of the town has been left as a landmark.

The best anchorage (1901) is as follows, in 33 feet L.W.S.T. sand and mud:—

| | | |
|-----------------------------|------------------|-------------|
| Tall Chimney | <i>N. 17° E.</i> | } Magnetic. |
| Flagstaff | <i>N. 24° E.</i> | |
| Old Lighthouse Tower . . | <i>N. 32° E.</i> | |
| New Lighthouse | <i>N. 47° E.</i> | |
| South Pillar and Beacon . . | <i>N. 76° E.</i> | |

The entrance to the river has not shifted for 17 years, but as the sand spit has been breached so many times, and in so many places, by the joint action of the sea and the floods in the south-west monsoon, it is quite impossible to say with authority from year to year where the best anchorage is until the monsoon is over.

A plan of the river 102 years old shows the entrance in its present position, but since that time and 1884 the entrance has changed its position no less than 14 times.

It is high water, full and change of the moon, at 11 hours; springs rise 6 to 7 feet, neaps $4\frac{1}{2}$ feet.

The principal exports are rice, coffee, pepper, sandalwood, spices, hides, horns, arecanut, coir, machine-made tiles and bricks, etc., valued at 128 lakhs of Rupees.

The imports are principally sugar, grains, salt, petroleum, dates, machinery, metals, piecegoods, European stores and liquors, hardware, coir yarn, cocoanuts, timber, bamboos, etc., valued at 51 lakhs of Rupees.

There are 100 boats belonging to the port, with a total capacity of 2,000 tons, and about 450 boatmen are always available.

Labour is abundant and good.

The cost of working cargo is from $3\frac{1}{2}$ to 5 Annas a ton, and landing and shipping costs, by contract, between 8 and 12 Annas a ton, Government rates being about 25 per cent. more.

The port is under the charge of a Port Officer.

The Hospital and Civil Dispensary are open to both European and native seamen.

The port is practically closed from the beginning of June to the end of August, during the south-west monsoon.

Pilotage is compulsory for all vessels over 100 tons.

There are six pilots under the orders of the Port Officer. They are always on the look out for vessels, and show a flag from their canoes.

Small repairs can be executed, and castings made at the local works, which are under European supervision.

New harbour works are in contemplation by the Local Government in the shape of training groynes for the river, and protection to the sand spits at the entrance. A voluntary tax is imposed on all goods landed and shipped, and the money so earned is devoted to improvements for the port.

There are extensive quays opposite the principal offices, and all the cargo is landed and shipped from the quay in front of the Sea Customs Office.

Provisions are plentiful, but not very cheap. Water can be put alongside in tanks at the rate of 2 Rupees per 800 gallons.

Small vessels can lie alongside the quay wall, and take their water on board from the hydrant.

Coal can be put alongside at the rate of 20 Rupees a ton for country coal, and 26 Rupees a ton for English or Welsh coal.

Over 1,000 yards of the reclamation of the foreshore have been completed, and from opposite the Custom House and Port Office a very fine steel screw pile pier has been erected.

This pier is nearly 200 feet long, and small steamers, native

craft, and cargo boats can lie alongside to discharge cargo at all states of the tide.

There are four Government cranes for lifting cargo, rails have also been laid on the pier and the wharves, both to the northward and southward, and trucks have been provided to enable merchants to ship their cargo more easily, and these conveniences are entirely free.

The entire work has cost nearly 80,000 Rupees, and is a very great and lasting improvement to the port.

It is proposed to extend the reclamation as far as the Marine Yard, and this will be done as funds allow from year to year.

All the work already completed, and that in contemplation also, has been constructed so as to fall in with the plans of the railway authorities, and it is hoped that the trade of the port will be increased in the near future.

Bills of health are free, and there are no Consular agents at the port.

Survey fees are usually 30 Rupees, survey of hatches 20 Rupees, extraordinary surveys 50 Rupees.

Brokerage at the rate of 4 Annas a ton for freight or chartering.

It is a regular port of call for the British India coasting steamers, and the Bombay Steam Navigation Company's steamers call here twice a week from Bombay and intermediate coast ports.

There is a large native passenger traffic with Bombay and coast ports, amounting to an average of 30,000 annually.

The number of native craft that entered the port in 1901 was 2,936, and their tonnage 97,967, and 168 steamers, representing 200,000 tons, and the trade is increasing yearly.

A railway between this port and Arsikere, in the Mysore State, is in contemplation, and will probably still further develop the coffee trade, and as South Canara is the most isolated district in the Madras Presidency it will be a great boon to the inhabitants, and will add greatly to the importance both of the town and port. The extension of the Madras Railway from Beliapatam is under construction.

Mulki, is a small customs port in Latitude 13° 5' 15" N., Longitude 74° 49' 35" E., but it is not of much importance. There is a small local trade carried on by small native vessels which find shelter in the river. The port is under the charge of a Sea Customs Superintendent. The town may be distinguished by a large Roman



KAUP LIGHTHOUSE.

Catholic Chapel, standing on a hill about 2 miles *N.N.E.* from the entrance to the river.

The **Mulki (Primeira) Rocks** are a group of small islets, and detached rocks, composed of black basalt, some of which are 50 feet above high water level.

They are a source of danger to vessels, especially from the northward, and it should be remembered that the foul ground extends into the 9 fathom line of soundings.

There is a safe channel between these rocks and the mainland, which is only 3 miles wide, between these rocks and the Kaup Rocks.*

This channel is always used by the coasting steamers belonging to Shepherd and Company.

The **Cahp (Kaup) Rocks** are both above and below water, and extend as far out as the 5 fathom line. At 4 miles *N.* by *E.* from the Mulki Rocks there is a dangerous patch of rocks awash, and at $1\frac{1}{4}$ miles *N.E.* of these rocks there is a solitary black rock with foul ground round it.

The Light has been exhibited from a rock, 2 miles *N.* by *W.* $\frac{1}{4}$ *W.* from Uchil, and from which the outermost Kaup rock bears *W.* by *N.* $1\frac{1}{2}$ miles.

A group flashing, white light, showing three flashes in quick succession every 10 seconds, elevated 140 feet above high water level and visible 18 miles in clear weather, is exhibited from a white tower constructed on a rock in Latitude $13^{\circ} 13' 30''$ *N.*, Longitude $74^{\circ} 43' 30''$ *E.*

A good land-mark in this vicinity is an isolated hill, 280 feet above the sea, with a temple inside a ruined fort on its summit, 4 miles *N.E.* from the new lighthouse.

There is a channel between the Kaup Rocks, and leading inside the islets to the Malpe anchorage, with irregular soundings of from 12 to 18 feet, but it is only safe for boats or steam launches; the same may be said for the inside channel between Malpe and Hangarkotta. These channels save time and distance.

The **St. Mary's Isles**, of which Deria Bahadur Ghur is the largest, are in Latitude $13^{\circ} 20'$ *N.*, Longitude $74^{\circ} 41'$ *E.*

The whole range, including Cocanut Island, extends 7 miles, the outermost being $2\frac{1}{2}$ miles from the beach.

A Light has been erected on these islands in place of the one at Malpe. It is an all round and much more powerful light, and is

intended to guide steamers to the inner anchorage at Malpe and through the narrow channel to the northward of the islands. It is a great boon, and much appreciated by the Masters of the small coasting steamers. It is a fixed, white, dioptric light, situated in Latitude $13^{\circ} 21' N.$, Longitude $74^{\circ} 40' E.$ It is elevated 64 feet above high water and is visible 9 miles in clear weather from all directions seaward. This Light is exhibited from 15th September to 31st May only.

The ruins of numerous old forts will be found on the islands, which were probably erected by Tippu, but unfortunately there are no records concerning them.

The islands are basaltic, and covered with long grass and creepers wherever there is any soil. The northernmost island is planted with cocoanut palms, and good water can be obtained on all of them.

There are many small rocks scattered about in the various channels between the islets.

Rocks awash extend 1 mile to the westward of Cocanut Island, and 2 miles *N.W.* of the same island, abreast of the entrance to the Silanadi, or Hangarkatta River.

These islands afford excellent shelter from the north-westers, and many native craft take advantage of the anchorage between them and the mainland. The small coasting steamers anchor to leeward of them, in 20 feet of water, with the Custom House just open to the northward of a tall factory chimney.

Malpe is a port of some importance, and is under the charge of a Sea Customs Superintendent.

The coasting steamers call four times a week, and a large number of native craft visit the port. It is also occasionally visited by the British India steamers which call here to load Mission tiles.

It is proposed to build a pier for cargo and passengers.

A dangerous rock with only 5 feet of water on it, on which the sea only breaks occasionally, lies *N. 53° W.*, $1\frac{1}{2}$ miles from the Lighthouse.

Hangarkatta was the port of the ancient city of Barkur which was of considerable importance in the 16th century, and was taken possession of by the Vijayanagar Rajas in 1335. Traces of the ruined city, the great fort, tanks, and the palace built by the Harihara Raja in 1370, are still in existence.

There are also ruins of Buddhist temples, which from inscriptions prove them to have been built in the 14th century.



Some curious old sculptures were discovered here, one of which represents armed men dressed like ancient Greek soldiery, and another of a centaur.

It is still an important port and there is a large export trade in rice and paddy, principally to Goa, for which purpose many native craft visit the port, and from which the Government derive considerable revenue, the duty on rice and paddy amounting to 20,000 Rupees in a good year.

The Bombay coasting steamers call here four times a week, and anchor just outside the bar, in 22 feet of water.

The Custom House is about a mile from the entrance, on the east bank of the river, and the inner anchorage is on the west bank, in 12 to 20 feet of water. In the fine season as many as a hundred native craft may be seen here loading for Goa and the ports in North Canara, and vessels of considerable size can enter the river, as the least water on the bar is 8 feet with a rise of 5 to 6 feet at high water, spring tides.

There are 25 boats belonging to the port, representing about 150 tons.

The cost of working cargo is about $3\frac{1}{2}$ Annas a ton.

There are extensive quays in front of the Custom House, and the principal merchants' offices, which have been extended and improved in 1897.

The port is under the charge of a Sea Customs Superintendent.

Kundapur is a town of some importance, and has a considerable trade.

The Portuguese seized it in the 16th century, and built a fort which is still in existence, and a strong, well built redoubt, on which the Assistant Collector's house now stands, was built by Hydar Ali in 1763.

Tippu had a dock at Gangoli.

The place was ceded to the English by the treaty of Seringapatam in 1799.

The port is really at Gangoli, on the north-western shore of the river, where there is deep water and anchorage for many native craft.

The Bombay coasting steamers call here four times a week, and a steam launch takes the passengers to and from the landing place.

Abreast of the port, and about 2 miles from the shore, there is a large reef, which is marked by a rock just awash, and on which the

sea always breaks; there is also another reef to the westward, and a rock the native boatmen call "Pate."

The best anchorage for the coasting steamers is in 22 feet of water, sand and mud, with the river-mouth open, and the Lighthouse bearing *S. 86° E.* magnetic, and the northern boundary pillar *N. 40° E.* magnetic.

The Light, in Latitude $13^{\circ} 37' 30''$ *N.*, Longitude $74^{\circ} 39' 40''$ *E.*, is a fixed, white, dioptric, port light of the 6th order, illuminating an arc of 180° , standing 45 feet above high water level. It is exhibited from a steel mast, and is visible in clear weather 6 to 8 miles. It is extinguished from 1st of June to 14th of September.

The coast between this port and Baindur is all rocky and foul ground, which extends as far as the 5 fathom line of soundings.

Mangalore.

South Canara District.

Between sunrise and 8 p.m.

Ordinary charges.

| | Outside the bar. | | | Inside the bar. | | |
|--|-------------------------------|-----|----|-----------------|-----|----|
| | Rs. | As. | P. | Rs. | As. | P. |
| For a boat of 10 corges (or 15 tons) burthen and upwards, per trip | *1 | 4 | 0 | 3 | 2 | 0 |
| For boats of less than 10 corges burthen but not below 2 corges per trip | *1 | 6 | 5 | *0 | 8 | 0 |
| For a boat of 1 corge burthen but less than 2 corges, per trip | 1 | 12 | 0 | 0 | 8 | 0 |
| For a boat receiving or delivering goods at the back of the surf | — | | | Half rates. | | |
| For a boat transhipping | Half rates according to size. | | | Do. | | |
| Return trip | Do. | | | Do. | | |
| Water trip, including filling and putting on board . per trip | According to agreement. | | | 8 | 0 | 0 |

Note.—An extra charge of 2 Rupees per 600 gallons is made for the use of the port tank, and 8 Annas per 100 gallons if casks are used. No charge is made when vessels use their own boats and casks for watering.

Extraordinary charges.

| | Outside the bar. | Inside the bar. |
|---|--|-----------------|
| For boats when employed between 8 p.m. and 4 a.m. | Double rates whether by corge or trip. | Double rates. |

In cases of extraordinary service, as rendering aid to a vessel in distress within the limits of the ports, the Port Officer, or other officer in charge of the port, shall adjudge and allow such additional hire as the circumstances of the case may seem to warrant, reporting the same for the information of the Collector of the district.

Malpe, Hungarkotta, and Kundapur.

South Canara District.

Between sunrise and 8 p.m.

Ordinary charges.

| | Outside the bar. | | | Inside the bar. | | |
|---|---------------------------------|-----|----|-----------------|-----|----|
| | Rs. | As. | P. | Rs. | As. | P. |
| For a boat of 10 corges (or 15 tons) burthen and upwards, per trip | 12 | 8 | 0 | 3 | 2 | 0 |
| For a boat of less than 10 corges burthen but not 3 corges, per trip | *1 | 4 | 0 | *0 | 5 | 0 |
| For a boat of 2 corges and less than 3 corges per trip | *1 | 8 | 0 | *0 | 5 | 0 |
| For a boat of less than 2 corges „ | *1 | 12 | 0 | *0 | 4 | 0 |
| For a boat of 1 corge when loaded with provisions „ | *1 | 8 | 0 | 0 | 8 | 0 |
| Return trip for any of above boats from same vessel „ | Half of the rates in each case. | | | | | |
| Return trip from a different vessel | Full rates in each case. | | | | | |
| For the report boat per trip | 1 | 12 | 0 | 0 | 8 | 0 |
| Water boat, including all charges „ | *1 | 12 | 0 | *0 | 4 | 0 |

Baindur is a small port of some importance in Latitude 13° 52' 15" N., Longitude 74° 39' 30" E. It had once a fort which belonged to a Jain Princess named Baria Dévi. It is mentioned by Duarte Barbosa in 1514.

There is a good anchorage inside the bar, which is used by native craft, but the approaches to the river are difficult and dangerous, and the foul ground extends out into five fathoms.

There is only seven feet of water on the bar at high water spring tides.

Baindur Head is a conspicuous object from seaward.

This port and Shirur are under the charge of a Sea Customs Superintendent.

Shirur is the northernmost port in the Madras Presidency, and is a sub-port of Baindur.

The name means literally village of the goddess Lakshmi. The ruins of ancient Shirur are extensive in the neighbourhood.

The entrance to the harbour is tortuous and dangerous, and the foul ground extends 2½ miles to seaward.

Once inside, the harbour is perfectly land-locked, and is a very picturesque little place. There is, however, barely any trade, except in firewood and coir, valued at 12,000 Rupees annually.

The Laccadive Islands.

The islands are known to the natives as "Laksha-dvipa," "The hundred-thousand Islands," or as the Divi Islands.

They consist of a group of 14 islands, lying between 10° and 14° N., and 71° 40' and 74° E., distant from the mainland about 200 miles.

Nine of the islands are inhabited, five of which are under the management of the Collector of South Canara, and four under the management of the Collector of Malabar.

For two and a half centuries the islands formed part of the Cannanore Principality, and were given to the Arab Sea Kings by the Chirrakal Raja in 1550.

During 1786 the islanders considered themselves badly treated, and transferred their allegiance to Tippu Sultan, and in 1799, after the treaty of Seringapatam, the five islands belonging to South Canara were not returned to the Bebe of Cannanore, but a remission of revenue was conceded instead.

The other four islands, belonging to Malabar, have always given the Government more trouble, and have been frequently sequestered for arrears of revenue, and they are now administered by the Collector of Malabar.

The revenue is derived from a monopoly of the coir yarn. The coir is paid for at fixed prices to the islanders and is afterwards sold by auction on the coast by the Port Officer, who is in charge of the coir, under the Collector of the District.

No change has been made in the price of the coir for many years, but to induce the islanders to take more pains and produce better yarn, Government has decided to give higher prices for the better sorts, and less for inferior kinds, with special prices for extra good yarn; these rules came into force in 1898.

Payment is made to the islanders partly in money and partly in rice and salt, and this arrangement appears to be popular with the people.

Occasionally they are hard pressed for food, when a steamer from Bombay is sent with provisions, as soon as the weather permits, at the close of the south-west monsoon.

The islands are visited from time to time by a European officer, but they are managed by a Monegar, who has magisterial powers.

An apothecary is stationed on the islands, and is in charge of a good hospital and dispensary, but the people, through ignorance, are slow to take advantage of it.

The islanders were certainly Hindus when they first settled there, and a tradition is preserved among them that their forefathers formed a part of an expedition from Malabar, which set out to Mecca for their apostate king Cheraman Perumal, and was wrecked on these islands.

They were probably made converts to Islam about 1,500 years ago, when Ibn Batutu visited the islands.

The men are good seamen and boat-builders, but very lazy and ignorant; the women do all the work in connection with the preparation of the coir yarn, and the men bring it to Mangalore, where it is well dried, weighed, and stored in the Government godowns.

They also bring shells, cocoanuts, copra, jaggery, and a sweet-meat called "vindia," for sale on the coast.

The climate is fairly healthy, but the islands are occasionally submerged in cyclones, as in April, 1847, and again in May, 1867.

The islands are very low, and, with the trees only 50 or 60 feet high, are not discernible at any distance.

The principal dangers to navigation are as follows :—

Suheli, the south-west danger of the group, is a reef with two small low islands. These two islands are well wooded, but not inhabited. The most southerly is in Latitude 10° N., Longitude $72^{\circ} 12'$ E., and the reef extends 6 miles in a S.W. by W. direction.

The channel between Androth and Kalpeni is perfectly safe, and clear of all dangers. A steamer may anchor in any part during the fine season, on the northern shore of Androth, within half a mile from the shore, in 5 fathoms. The landing place is opposite the main village.

This island bears from Mount Dilli N.E. $\frac{1}{2}$ E. 113 miles.

The Elicalpeni Bank, which is 28 miles N.E. of Androth, is composed of coral, and the soundings on it vary from 9 to $3\frac{3}{4}$ fathoms; it should therefore be avoided.

There is a small sandbank, about 6 feet above the level of the sea, 15 miles *N.N.W.* from the North end of Kavaratti Island. It is of small extent, and has a black rock on its eastern side.

The anchorage at Amini Island is on its southern side, close to the shore, in 8 or 10 fathoms.

At Kiltan, the best anchorage is off the *N.W.* point, quite close in shore, in 7 fathoms.

At Chetlat the anchorage is in 8 fathoms off the south end of the island.

It is high water, full and change of the moon, at 10 hours, 30 minutes; springs rise $6\frac{1}{2}$ feet, neaps 4 feet. The flood tide sets to the *N.E.*, and the ebb to the *S.W.*

When visiting these islands it is advisable to take a pilot. The writer knows of one man who lives on Amini Island, and known as pilot Ali. He keeps a navigation school on that island, and is conversant with all the anchorages, channels, and dangers round the islands; he is an equally good pilot for the Maldiv Islands, and originally came from Minicoy.

He has piloted several British gun-boats and large yachts in and around all the islands, and is quite reliable.

The Laccadives are much better known as the Amindivis, and have come into considerable prominence lately in connection with the persistent efforts made by the late Sultan Ali Rajah to recover them from the Government, which had, in 1877, sequestered them for the second time owing to arrears of revenue. The Amindivis are only a continuation of the Laccadive chain, and form its northern extremity. They consist of five islands and a few isolated little reefs. They lie about 200 miles off the coast of South Canara, and run nearly parallel to the coast line. The largest of the group is not more than three square miles in area. They all present a flat surface, which nowhere rises higher than 15 feet above sea level. A belt of coral runs round each island, enclosing a lagoon, and the water in some of these havens is so still during all seasons that the islanders soak their cocoanut fibre there without fear of its being washed away. The surface soil on the Amindivis consists of a thin layer of coral or limestone, loose wet sand existing under the crust. By breaking through this crust, and scooping out the sub-soil, pools of fresh wholesome water are easily formed. The productive capacity of the soil is very inferior, and admits of the growth of scarcely

anything else than the cocoanut palm ; but some of the islands yield, or used to yield, a fine species of lime as well as of bread-fruit.

In 1786 the inhabitants of the Amindivis revolted against the Beebee, or Princess, of Cannanore, and transferred their allegiance to Mysore. In 1799, when Canara passed over to the East India Company, the Amindivis were not restored to the Beebee, but a remission of revenue (5,250 Rupees) was conceded instead ; hence the different status of the two portions of the group. Thus they continued to be under the jurisdiction of the Collector of South Canara. The islands are in the happy position of "Scheduled tracts," that is, they are subjected only to those Indian laws which are suited to them. The chief Government official is styled the Monegar. He draws 85 Rupees a month, and is an official pluralist, being invested with inferior magisterial powers, and being also the head of a local Council of Customs, constituted for the purpose of trying and punishing those who transgress the time-honoured customs that obtain on the islands. According to local usage adultery is an offence against custom, and though under British law it is triable only by a first-class magistrate, the Monegar is empowered to enquire into such cases, and to fine the offenders. The law of custom also empowers him to convene the islanders for *corvée* purposes, such as destroying rats, launching large boats, and such other undertakings as are calculated to benefit the general community. As in the southern part of the group, the rat is the greatest curse to the Amindivis. Notwithstanding periodical rat hunts, organised on an extensive scale, the destructive little rodent flourishes everywhere, and is responsible for the destruction of thousands of cocoanuts yearly. The Monegar, we may note, is a combination of judicial and revenue functionary, and is assisted in his official duties by a staff of peons and accountants. The islanders are free from taxation, but their happiness in this respect is not quite complete, for court fees are levied from them. The Government revenue is derived entirely from the coir monopoly, which is not always a source of profit.

The population of the group numbers about 4,000, and the religion of the people is a crude form of Muhammedanism, similar to that followed by the Moplahs. The language is a corrupt form of Malayalam, which is, however, written in the Arabic characters. There is plenty of evidence to show that the inhabitants were originally Hindus who went over to Islam within quite recent times.

The caste system obtains, with certain local modifications, and the bulk of the people are governed by the metronymic law of succession, though that of filial succession also obtains, and not seldom both systems are found in operation among the same family, with the result that partition disputes often prove hard legal riddles to solve. How strong a hold the law of metronymy must have held on the islanders in earlier times is seen in the fact that it is still accounted among the gravest of offences on the islands for a man to turn his sister out of doors. The people have a legend that they are the descendants of an expedition which was wrecked on the islands while voyaging to Mecca in search of Cheruman Perumal, an individual who has caused considerable dissensions among historians and antiquarians. Like those of the Laccadives, the people of the Amindivis practice monogamy, and impose but slight restraints on divorce. Their women enjoy considerable freedom, and move about freely in public with their heads uncovered. Female emancipation of this sort, it goes without saying, is rare in the Moslem world, but the peculiarity of the Amindivi folk in this respect is traceable to the circumstance that the men are constantly away from home, either on their deep-sea fishing expeditions, or trading on the mainland, so that the women have perforce to attend to a good deal of the outdoor as well as the indoor business of the community. This being so, it would be decidedly inconvenient to enforce the rigorous regulations of the Muhammedan world generally. The traveller who steps ashore on any of these inhabited islands is surprised to find himself greeted by inquisitive groups of picturesquely clad women, and by knots of children of various ages and size.

The main industry on the islands is, as we have remarked, the preparation of coir fibre. Jaggery syrup and rice cakes of a hard consistency, and prepared so as to keep very long, are also largely manufactured both for local consumption and as marketable commodities for the mainland. Though a good many of the islanders can read and write their own Malayalam jargon, the intellectual condition of the general community is still very low. But for all that, who shall say that these coral reefs are any the less the Islands of the Blest? If ignorance is bliss, it must be completely so where all are ignorant, and where book wisdom and world knowledge are personified once in a way, and at long intervals, by a young civilian from the mainland. How many must there be in the big world who, smitten

with the Welt-Schmerz, would gladly exchange their existence for that of the primitive and isolated inhabitants of those unsuspected isles in far off seas of which Browning sings.

Four of the islands belonging to the South Canara District are inhabited, namely, Chekat, Kadamat, Kiltan, and Ameni, the latter being the principal island.

The islanders exist by fishing, and cultivating the cocoanut trees for their many products.

There is no very great trade, the greatest export is of coir and copra, and the principal imports rice and salt.

The people, however, are, although islanders, bright, good fishermen, and hard-working, but ignorant and bad farmers.

Their sea-going boats, which are known as kundras or odums, are not good sailers on a wind, and generally wait for a fair or leading wind before leaving the mainland for the islands.

On the whole they navigate their vessels fairly well, and an attempt to teach them the rudiments of navigation and the use of the sextant has given fairly good results.

Contrary winds sometimes detain the boats on the mainland for weeks at a time, and then the islanders suffer from famine. On these occasions the unvaried diet of fish and cocoanuts causes bowel complaints which are often fatal.

The people are to a man Mussalmen, and very ignorant and bigoted. They send their children to the Koran schools to learn the holy texts by heart, and tie charms on them, but they cannot be induced to send them to free Government schools to learn the three R's.

This may be seen from the figures showing the school attendance which averages 257 children attending the Koran schools, while 30 only attend the Government schools.

Perhaps in all this the islanders are not to blame, if all education is run upon the same red tape lines that made the authorities yearn after the appointment of Canarese knowing teachers, because the islands belonged to South Canara, though the Canarese language is utterly unknown on the islands, the language being Malayalam, the dialect being written in Arabic characters—a nice mixture.

That the islanders, however, and those who go to dwell with them, care naught for red tape, is shown by the doings of a

Government teacher, one Kadri Haji, who was trained in Calicut and given charge of a school in Amini.

All went well whilst he was attached to the most popular religious teacher in the island.

This good man died and Kadri Haji's pupils fell off.

He was found at last giving religious instruction to 22 pupils, and teaching 8 only something more useful in this world than the next. Government was thus engaged in imparting gratuitous religious teaching. May this reckon for salvation hereafter.

Of the physical state of the islanders we are told that in some ways they are better off than the dwellers on the mainland. They live amid better surroundings than those of the same class on the continent, overcrowding and the unhealthy conditions arising from packed parcheries are unknown.

The beautiful, fresh, clean sea-breeze blows through their houses and villages, and the sun gets in everywhere, while there is no water-logging.

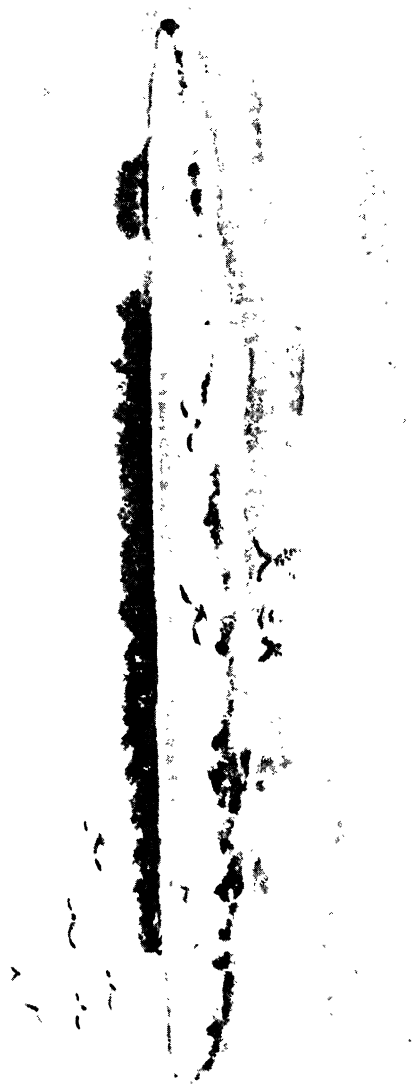
Of a consequence, though they have to suffer greater hardships through insufficient food, long periods of scarcity, seemingly insufficient shelter and extreme poverty, the islanders are a healthier and finer lot than on the mainland. As an average the men and women are well grown and powerful, the men being especially muscular and capable of great endurance.

When rowing from island to island they never take it easy, and pull for six hours or more continuously.

In 1893 a terrible outbreak of cholera swept over the islands and carried off nearly half the population, but they are recovering slowly but surely. The population was 3,566 in 1901; all the islands, however, are supporting nearly as many as they comfortably can.

Both boys and girls are married, when adult, by the orthodox Mussalman ceremony. Both husband and wife may divorce each other without restraint; if the wife wishes to be divorced she intimates the fact to her husband, who is bound by custom to obey. Both parties continue after marriage to live in the house of their own families, but a married man is not allowed inside his parents' house between sunset and sunrise, he must remain with his wife.

He takes his evening and morning meals at his wife's expense, for which he pays her a certain amount of rice, which varies in different cases from 4 to 7 muras a year.



Nearly all internal trade is carried on by the barter system. The wages of artizans are generally paid in cocoanuts, and coolies simply earn a daily supply of food by their toil. Besides this there exists a system of household service in the families of the bigger men which is indistinguishable from slavery. It, however, prevents anything like pauperism, for these servants when old and useless are still kept; besides, all the islanders are related more or less, and there are no beggars except some coast-folk introduced as wives or servants.

Divorce being so easy a coast-girl who marries an islander has little chance when she grows old or becomes widowed; she is without friends or relations, and cannot return to her own people. The coast boys when they grow useless are in much the same condition.

The chief commerce is in coir, and the Government monopoly has caused a great increase in the quality and the price of the fibre. There has been a slight falling off in the quantity twisted, but the increase in price owing to improved quality has more than compensated for this. There are difficulties ahead, however. The coir is paid for principally in rice, and the exchange question is as difficult in these primitive islands as in the great cities of the empire; since they were first fixed the prices of both rice and coir have fluctuated, and should coir fall badly and the rice rise higher there will be a financial crisis.

The islands, however, just pay their way, and the islanders are so satisfied at the profitable way in which Government has disposed of their coir that they want it to make a monopoly of copra also. They say that they are not good traders and that the agents on the coast, though they give big wages, cheat them so abominably in weight that they would prefer to sell to Government at lower prices and be sure of fair dealing.

The people on the Chetlat Island are the poorest of all the islanders, and the soil of their island is very poor too. The people work hard at fishing, and the island is fully planted with cocoanut trees. Everything that the island produces is utilized by the inhabitants, even the cadjans (dried cocoanut branches) are exported for sale on the coast.

In the other islands these branches are allowed to lie where they fall, to the great benefit of the soil.

The people of Chetlat are too poor to allow even this benefit to the soil, which is consequently pure sand and not sandy earth as on the other islands.

For this reason perhaps the trees are small and bear but poorly.

Limestone and coral are also exported to the coast from Chetlat. In spite of their poverty the people are strong and healthy, and they make the best sort of coir both as to colour and twist, and no man ever husks an unripe fruit wastefully; it is always removed in a manner which makes it available for coir making.

This full utilization of all material is the most striking feature of this island. In Chetlat alone the men climb the trees without the aid of ropes, walking on all fours up the tree with the action of a bear walking. This has a most remarkable appearance, and develops the muscles of the arms considerably.

The people believe that this accomplishment is the gift of a Saint, whose tomb is on the island.

The above extracts are taken from the report to Government by A. F. G. Moscardi, Esq., I.C.S., who visited the islands in 1890, and from the *Madras Mail*.

CHAPTER V.

Ports in the Bombay Presidency.



The best land-marks on the coast between Kundapur and Bhatkal are the mountains of Bednore.

Yelgetty Gudda, the southernmost peak, is 2,950 feet high, Barsilore Peak is 3,600 feet high, and Kadachadri, or False Barsilore, is 4,400 feet above the sea level and is the most distinct of all these peaks ; there is an excellent bungalow on its south-east side built by the Maharaja of Mysore for a shooting-box.

The coast between Baindur and Bhatkal is not safe to approach within 6 fathoms, as there is much foul ground and many dangerous patches of rock, some of which show above water, and are of a dazzling white appearance in the bright sunlight.

Bhatkal is the most southern port in the Bombay Presidency, and is about 7 miles North of Baindur.

The Rocky Point, on which the fort and flagstaff are situated, stands out boldly, and may easily be distinguished. The town itself is about a mile up the river, and the entrance over the bar is very narrow.

There is a small trade carried on by native craft, and it is a regular port of call for the Shepherd line of steamers.

The best anchorage is opposite the entrance to the river, quite close inshore, in 19 to 25 feet of water, with the lightstaff bearing *N. 47° E.* magnetic, and Hog Island *N. 87° W.*

The Mussalman merchants call the place Nawáyat, said to mean "newly arrived," owing to their being driven by persecution from the Persian Gulf in the 8th century.

From the 14th to 16th century it was a flourishing centre of trade, and the Portuguese had a factory here in 1505.

The following rocks have been reported by the officer in charge of the Marine Survey of India :—

- (1) Rock with 15 feet on it, lies 1·8 miles *S.* $9\frac{1}{2}^{\circ}$ *E.* of the summit of Hog Island, and 1·75 miles from the nearest point of the coast in Latitude $13^{\circ} 58' 45''$ *N.*, and Longitude $74^{\circ} 28' 40''$ *E.*
- (2) Rock with 18 feet on it, lies 0·9 miles *S.* 64° *W.* of the Southern of Two White Rocks in Latitude $13^{\circ} 52' 40''$ *N.*, Longitude $74^{\circ} 30' 55''$ *E.*
- (3) Rock with 30 feet on it, lies 1·6 miles *S.* $60\frac{1}{2}^{\circ}$ *W.* of the Southern of Two White Rocks in Latitude $13^{\circ} 52' 18''$ *N.*, Longitude $74^{\circ} 30' 15''$ *E.*
- (4) Rock with 11 feet on it, lies 5·1 miles *S.* $10\frac{1}{2}^{\circ}$ *E.* of the Southern of Two White Rocks, and 4 miles from the nearest point of the coast in Latitude $13^{\circ} 48'$ *N.*, Longitude $74^{\circ} 32' 30''$ *E.*
- (5) The position assigned to the rock off Bhatkal is erroneous. This rock lies 1·08 miles *S.* 34° *W.* of Bhatkal Light, in Latitude $13^{\circ} 57' 10''$ *N.*, Longitude $74^{\circ} 30' 40''$ *E.*, and has 12 feet least water on it. A red can buoy is moored close to its western edge.

CAUTION—Several rocks inshore of those reported in this notice, not marked on the Admiralty charts, having been found during the survey of the South Canara coast between Hog Island and Kundapur, vessels are hereby cautioned not to approach this portion of the coast too closely, especially in the vicinity of Single White Rock and Two White Rocks. All the bearings given are true.

Twice the British attempted to establish themselves here, in 1638 and 1668, but both times failed, and all the English residents were cruelly murdered in 1670.

According to Captain Hamilton (1690-1720) the remains of a large city and many Jain and Brahmin temples were in existence.

The Light, in Latitude $13^{\circ} 58'$ *N.*, Longitude $74^{\circ} 31'$ *E.*, is situated on the summit of the hill which forms the northern boundary of the bay. It is a fixed, white light, standing 100 feet above high water level, and is visible 8 miles in clear weather from *S.* 56° *E.*, through East, to *N.* 11° *E.* It is exhibited from 1st October to end of May.

The light is obscured in the direction of Single White Rock and Hog Island.

There is a dangerous sunken rock about $\frac{3}{4}$ of a mile south of the anchorage, which is marked by a buoy from October to May.

Hog Island, in Latitude 14° N., Longitude $74^{\circ} 28'$ E., is 300 feet high, and has rocks extending from it in a south-easterly and northerly direction.

Pigeon Island is 335 feet high, and may be seen 20 miles in clear weather. It stands in the 18 fathom line, is steep to, and safe to approach on all sides.

The foul ground in the vicinity of Modeshwar Cape extends over a mile to seaward.

Dart Rock lies with Hog Island bearing *S.S.W.* $5\frac{1}{2}$ miles, and Pigeon Island, *S.W.* by *W.* It is a dangerous rock, and only breaks during heavy weather, having 9 feet of water on it, and 6 fathoms mud, close around to the westward. It is, however, marked by a buoy from October to May, which lies 80 yards *E.* by *N.* from the rock, in $7\frac{1}{2}$ fathoms.

The small coasting steamers can go to the eastward of these islands, and keeping in from 6 to 10 fathoms 2 to 3 miles off the shore.

Honawar (Honore) is a port of some importance, having considerable trade, and is frequented by many native craft. Shepherd's steamers call here four times a week in the fine season.

The town is mentioned by Abulfeda in 1273, and again by Ibn Batutu in 1342, who describes it as an important place having large schools.

The Portuguese built a fort here in 1505, and having quarrelled with the king, attacked and burnt the town in 1507.

It is spoken of as "Onor" by Frederick in 1563, and again by De la Valle in 1623.

On the decay of Portuguese power it was taken possession of by the Bednur kings, who, in their turn, were forced to submit to Haidar Ali when he overran the country.

It was taken by the British by assault from Tippu Sultan in 1783, but we were obliged to give it up under the Mangalore treaty.

On the overthrow of Tippu in 1799 it again came into our possession under the treaty of Seringapatam.

Visitors proceed from here to the celebrated Gersoppa Falls, 36 miles inland.

The town is about two miles from the entrance to the river, which is over 300 feet wide. The bar is very dangerous even in the fine season, but once inside, there is excellent accommodation for a large number of vessels in the large lake, which is about 5 miles long and 1 to 2 broad.

There are five islands in this lake, the largest of which is three miles long, and is covered with cocoanut palms.

The Light, in Latitude $14^{\circ} 16' N.$, Longitude $74^{\circ} 25' E.$, is a fixed, white light, visible 6 miles in clear weather between the bearings of $S. 45^{\circ} E.$, through East to $N. 13^{\circ} W.$, and is exhibited from a wooden mast standing 23 feet above high water level.

This light is shown from 1st October to the end of May. It is obscured in the direction of Fortified Island.

The best anchorage is with the Lightstaff, bearing from $E.$ to $N.$ by $N.$, in $4\frac{1}{2}$ to 5 fathoms, soft mud.

The small steamers anchor on the same bearing about $\frac{1}{2}$ a mile from the shore.

The channel between Fortified Island and the main is quite safe for small steamers.

Fortified Island is two miles from Honawar, and $\frac{1}{2}$ a mile from the shore. It is 200 feet above sea level; there are extensive fortifications at the base of the hill in very good preservation, supposed to have been built by the Portuguese.

Kumta is an open roadstead, and is frequented by many native craft from Bombay, and from ports on the Konkan Coast. The trade has, however, declined since the construction of the Marmagão railway.

It has no particular history, but had the misfortune to be twice burned down by Tippu's troops.

Shepherd's steamers call here four times a week.

The best anchorage is to the south of the point in $3\frac{1}{2}$ to 4 fathoms, sand and mud, and good holding ground.

The Light, in Latitude $14^{\circ} 25' N.$, Longitude $74^{\circ} 23' E.$, is situated on the North side of the entrance to the creek.

It is a fixed, white, dioptric light of the 5th order, and is exhibited from an iron tubular mast, standing 116 feet above high water level.

The light is visible 12 miles in clear weather between south, through east, and north, to west.

Very beautiful sandalwood carving is done at Kumpta, and is the principal industry.

Snail Rock is about one mile from the beach, and $1\frac{3}{4}$ miles north of Kumpta Point.

It resembles a snail when seen from the anchorage at Tadri.

Tadri is situated at the mouth of the Agnashini river.

It is a regular port of call for the Shepherd Line of steamers and is also frequented by many small native craft.

It may be easily distinguished by Flagstaff Hill, which is 440 feet above the sea level.

Vessels of considerable size can enter the river, as there is 14 feet of water on the bar at high water springs.

Tadri is also frequented by many hundreds of pilgrims, who pass through to a shrine, which is of great repute among the Brahmmins, at a place called Gokarn "cow's ear."

The anchorage is good and well protected, and the small coasting steamers can anchor just outside the bar in 20 feet low water.

The deep water anchorage is in 5 fathoms, mud, and good holding ground, as follows:—

| | | |
|-----------------------------|---|-------------|
| Rajahman Droog Hill bearing | <i>E.N.E.</i> | } magnetic. |
| Tadri Outer Cape | „ <i>N.W. $\frac{1}{2}$ N.</i> | |
| Kumpta Light | „ <i>S.E. $\frac{1}{2}$ S.</i> | |
| River Entrance | „ <i>N.E. by E.</i> | |

It is high water, full and change of the moon, at 10 hours; springs rise 7 feet, neaps 4 feet.

The Light, in Latitude $14^{\circ} 31' N.$, Longitude $74^{\circ} 20' E.$, is situated on the hill North of Tadri river, and is a fixed, white light, exhibited from a wooden mast 100 feet above high water level, and is visible 8 miles in clear weather from East, through North, to *N. $17^{\circ} W.$* , but is obscured in the direction of Snail Rock. It is shown from 1st October to the end of May.

The most conspicuous objects between Tadri and Karwar are:—

Tulsiparwal and **Belikeri Point**, the latter is low but it may be known by the large bungalow on its summit, making it very conspicuous; and the former is a peaked hill with a black top, 4 miles *N.E.* of Ankola, and 1,680 feet high.

Godhully Peak is 4 miles East of Karwar, and 1,800 feet high. It can be seen for 40 miles in clear weather.

Anjediva Island belongs to the Portuguese. It is 200 feet high and has cocoanut trees on its summit. On the eastern side there are several houses, and a fort and flagstaff. There is a small rocky island, named Round Island, $\frac{1}{2}$ a mile East of Anjediva, about 40 feet high.

There is a perfectly safe channel between Anjediva and the mainland, with $5\frac{1}{2}$ to 6 fathoms of water.

Karwar Head, 660 feet high, is covered with jungle, and is steep to, there being $4\frac{1}{2}$ and 5 fathoms of water close under the cliffs.

The channel between Karwar Head and Elephant Island is perfectly safe, with depths of 5 and 6 fathoms, and a muddy bottom; outside Elephant Island, and about $\frac{1}{2}$ a mile N.W., there is a rock known as Karwar Rock.

On the west side of Karwar Head there are two white boulders, on the lower of which a verticle red stripe has been painted; these two boulders in line lead over the rock, which has only 9 feet of water on it.

Karwar is the only safe port, except Marmagão, between Bombay and Narrakal, during the south-west monsoon.

Old Karwar, three miles to the east of the present town, on the banks of the Kálinadi, was once an important town. It was burnt by Sivaji in 1764.

The English first established a factory here in 1638, which was very prosperous until 1676, when the native chiefs became so exacting that the factory was closed in 1679. It was, however, re-opened on a larger scale in 1682, but the natives and the Portuguese and Dutch made every attempt to depress our trade, and the factory was removed in 1720.

The Mahrattas laid Karwar waste in 1697, and in 1715 the old fort was pulled down and Sadashivgarh was built by the Sonda chief.

In 1801, old Karwar was in ruins. The new town dates from the transfer of the district to the Bombay Presidency in 1862.

It was proposed to connect Karwar with the interior by a railway, so as to provide a port for the cotton trade, but, owing principally to political intrigue, the line was taken to Marmagão in Portuguese territory, and from the time the line was built the trade at this port began to decline, and is now practically ruined.

KARWAR.



There is a cluster of islands in the bay, called Oyster Islands, with much foul ground and many rocks in their vicinity. The principal and outer dangers are marked and the channel is buoyed.

A red buoy is moored in $6\frac{1}{2}$ fathoms, $\frac{1}{10}$ of a mile *S.E.* of the rock, to the eastward of East Island.

A red buoy is also moored on the western side of Parker Rock.

There is also two small islands, 180 and 120 feet high, which afford shelter to native craft.

When entering the harbour during the south-west monsoon it is better to go to the southward and westward of the Oyster Rocks, but in the fine weather the *N.E.* passage may be used with perfect safety.

The outside anchorage is in 5 fathoms, sand and mud, with the Oyster Rocks Lighthouse bearing *S. 68° W.* and East Island *S. 5° W.*

The inner anchorage is in from 3 to 5 fathoms, sand and mud, with the red light on the Port Office Flagstaff *S. 68° E.*, and the end of the jetty about south.

Oyster Rocks Lighthouse, in Latitude $14^{\circ} 49' N.$, Longitude $74^{\circ} 03' E.$, is situated on the summit of the Island Deogarh, and is a fixed, white, dioptric light of the 1st order, illuminating an arc of 180° between *S. 18° E.*, through *E.* to *N. 18° W.*, standing 210 feet above high water level, and visible in clear weather 20 miles.

It is a circular column, built of stone, and painted white.

The light on the Port Office Flagstaff is a fixed red light, standing 65 feet above high water level, and is visible about 3 miles seaward from *S. 78° E.*, to *S. 38° E.*

It is high water, full and change of the moon, at 10 hours 36 minutes; springs rise 7 feet, neaps 4 feet.

It is a regular port of call four times a week for Shepherd's Line of steamers.

The British India gave up their connection with the port when the trade was diverted to Marmagão.

The coast between Karwar until off the Marmagão Peninsula can be approached with safety, keeping in about 5 fathoms of water until off Cape Ramas, which is easily distinguished from False Cape Ramas as it has a flagstaff on its summit. It is steep to, having 9 fathoms within one mile of its extreme point. Cape Ramas Lighthouse in Latitude $15^{\circ} 5' N.$, Longitude $73^{\circ} 54' 6'' E.$, is situated on the Cape. It is a fixed, white light, elevated 203 feet above high water, and is visible 15 miles in clear weather.

The dangers after passing the headland lie out in as far as the 10 fathom line, and are composed of the St. George's Islands, and various rocks in their vicinity. There are channels with 5 and 6 fathoms of water between all these islands.

There is also a safe channel for small steamers between the main and all the dangers round the islands.

A large steamer making for Marmagão from the southward should, after passing St. George's Islands which are steep to on their sea-face, steer *N.* until the north cliff of Secretario Island is seen just open of Chiquilim Point, bearing *S. 85° E.*, which will lead into 5 fathoms of water off Marmagão Point, then steer for the flat-topped black buoy, marking the Marmagão Rock, and pass it on the port-side, and from there to the red conical buoy, marking the rubble at the end of the breakwater, leaving it to starboard, and anchor as convenient.

This red buoy is laid down 900 feet from the extreme end of the breakwater, and is moored in 14 feet of water, but there is deep water about $\frac{1}{10}$ of a mile outside.

In making the harbour from the northward, pass Aguada Head about $\frac{3}{4}$ of a mile off, and when the East cliff of the East St. George's Island is in line with Buffalo Rock, bearing *S. 11° E.*, a vessel is clear of all dangers to the westward of the entrance to the bay; and when the north cliff of Secretario Island is seen just open of Chiquilim Point, steer for the black buoy as previously directed.

Marmagão, in Latitude $15^{\circ} 24' 30''$ *N.*, Longitude $73^{\circ} 47'$ *E.*, is a Portuguese possession about 225 miles south of Bombay, and is situated on the southern side of the harbour of Goa, on the left bank of the Zuari River.

It was connected with the mainland by a narrow strip of sand, about a quarter of a mile broad, and about 10 feet above the sea level, but this land has all been reclaimed by the Railway Company and built over.

The port is situated on the eastern extremity of the peninsula, and is about 5 miles south of Aguada Lighthouse at the entrance of the river leading to Panjim.

At the end of the 17th century the Count of Alfor resolved to abandon Goa on account of its unhealthiness, and in 1684-1685 the foundations of a new capital were laid in Marmagão.

To face page 277.

In Marmagão Harbour, a fixed light, showing red and white sectors, and visible six miles, is exhibited from a white mast 49 feet high in Latitude $15^{\circ} 24' \frac{3}{4}$ N., Longitude $73^{\circ} 47'$ E. at the intersection of the inner end of the breakwater with the quay wall; the white light is visible through an arc of 74° over the anchorage, and the red light through an arc of 107° seawards. Vessels should not leave the leading line of Chiquilim and Secretario Lights in one $S. 79^{\circ} E.$ until the white light is sighted. The red light at the extremity of the pier is discontinued.

The works were stopped, however, the next year, and not begun again until 1688.

The Viceroy changed his residence to Marmagão in 1703, but for some reason all further work was stopped by the King of Portugal in 1712.

The harbour is protected by a breakwater 1200 feet long, and a quay wall runs at right angles to the breakwater, and is capable of berthing several large vessels.

The harbour is spacious, covering about 99 acres, with plenty of water and accommodation for the largest vessel.

There is 24 feet of water alongside the quay wall at lowest spring tides.

It is high water, full and change of the moon, at 10 hours 33 minutes ; springs rise $6\frac{1}{2}$ feet, neaps 4 feet.

Three white cylindrical buoys are laid down parallel to the quay-wall in 27 feet of water, and are used for breasting vessels off the quay.

Two white, fixed, leading lights, visible from a distance of 12 miles, are exhibited from two cylindrical columns, painted white, in Marmagão Harbour ; the front light is situated on Chiquilim Point, the rear light on Secretario Island, about 14 cables *S. 78° E.* from the front light.

The approximate position of the light is Latitude $15^{\circ} 24' 35''$ *N.*, Longitude $73^{\circ} 49' 50''$ *E.* The two lights in one bearing *S. 78° E.* lead into the harbour.

A red fixed light is exhibited from the extremity of the pier, visible about 4 miles through an arc of 76° over the anchorage.

The black can buoy marking Marmagão Rock and the red buoy marking the submerged end of the pier have been withdrawn.

The Portuguese Government will also erect suitable landmarks on Chiquilim Point and Secretario Island as a leading line into the harbour.

The Bombay Steam Navigation Company's passenger steamers from Bombay and coast ports call every evening during the fine weather, and leave again on the arrival of the passenger train from Londa, calling at Panjim and coast ports en route to Bombay.

Passengers and cargo are carried to coast ports south of Marmagão as far as Mangalore by the same line, during the fine

weather season, leaving Marmagão on Tuesdays and Saturdays after the arrival of the passenger train from Londa.

These steamers call again at Marmagão on Wednesdays and Sundays in time to catch the mail train to Londa.

The harbour can be entered at any time of the day or night.

There is no pilot, but on the usual signal being displayed the Railway Company will send out a man to render assistance.

Many of the buildings at Marmagão were pulled down to permit of the construction of the railway.

The building known as the Palace is now used as the offices of the Western India Portuguese Railway, and an old church two miles from the harbour, being the only two relics left. The church is in the village of Vasca da Gama.

Marmagão is the terminus of the Western India Portuguese Railway, and connects with the Southern Mahratta Railway at Castle Rock. It has become an important and busy place.

Good fresh spring water can be obtained from the hydrants on the quay at 1 Rupee per ton.

Port dues are 1 Anna per registered ton, available for 30 days. There are special concessions for vessels bringing 1000 tons or over of cargo, and also for steamers landing passengers only. Quay dues are $1\frac{1}{2}$ Pies per registered tonnage per day.

The work of loading and discharging is done by the Railway Company, whose goods-waggons run alongside the vessels and opposite to the large godowns built on the quay.

There is one 25-ton steam crane, and six $1\frac{1}{2}$ -ton steam cranes on the quay, constructed to plumb the hatches of any vessel.

The average day's work for bales or bags is 1000 tons.

For discharging general cargo or iron work 500 tons per day of 9 hours.

Coals 500 tons per day of 9 hours including weightment.

The railway taps all the rich cotton-producing country, and the bulk of the produce is exported *viâ* Marmagão, and transhipped to Bombay by the coasting steamers.

Every facility is offered for direct shipment to Europe, and many large steamers call with cargo direct from England and the Continent.

The Sea Customs Department is under the charge of the Portuguese authorities, and the preventive officers board all foreign

steamers on arrival, and remain on board, being housed and fed by the ship.

Special arrangements are made for all goods brought from British territory and passing through Marmagão to Castle Rock, and all such cargo is exempt from duty.

Manifests of all cargo and stores, together with a list of the crew, must be presented at the Custom House on arrival. All articles are dutiable.

All vessels on entering the port should fly the quarantine flag until the ship is passed by the Health Officer, who boards every vessel.

The legal representative of the port is the Captain of the Port, a Portuguese Naval Officer, but the berthing and shifting of vessels in the harbour is carried out under the orders of a British Officer, who is a servant of the Railway Company.

Fresh provisions are plentiful and cheap.

The principal exports are cotton, grains, and seeds; and the imports, salt, kerosene oil, piecegoods, rice, twist, machinery, Mangalore tiles, etc.

There is a large and increasing passenger traffic with Bombay and Mangalore, and all the intermediate minor ports.

Labour is obtainable, but notice should be given beforehand if possible.

The Railway Company have always men ready to work the steamers coming alongside the quay.

Wharfage is charged on all goods landed.

There are sufficient boats and lightermen for the requirements of the port.

Working cargo costs from $2\frac{1}{2}$ to 5 Annas a ton, according to the nature of the cargo.

The weather is uncertain from the beginning of June to the end of August during the south-west monsoon.

Panjim is situated on the left bank of the Mandavi River, and became the capital of Portuguese India in 1843, and the Viceroy has resided there since 1759.

From the river the appearance of the city with its elegant buildings is most picturesque.

The public buildings and barracks are very imposing, and in the square there is a life-size statue of Albuquerque standing under a canopy. There are many other very fine buildings, including the

cathedral, palace, court, custom-house, jail, hospital, all of which are worth seeing.

The history of Goa is traced back as far as A.D. 109, when it belonged to the ancient Hindu kings of the Kadambas, who apparently ruled the country until 1312, when it fell into the hands of the Muhammedans.

It was, however, re-taken in the time of Harihara, the Vijayanagar king, whose heirs retained it for about 100 years.

In 1449 it was conquered by the Mussalman king of the Deccan, and when Vasco da Gama landed at Calicut in 1498, it was subject to the Bijápur sovereign, who retained it until 1510, when Goa was captured by Alfonso Albuquerque.

Goa rapidly rose in importance, and in the days of its glory was the chief centre of commerce in India. The people gave themselves up to profligacy, luxury, ostentation and every vice under the sun, until they received their first check in 1603, when the Dutch blockaded Goa.

The Dutch were not successful, but from that time the Portuguese power was doomed. One by one their possessions were taken from them, and their fleets and commerce destroyed on the high seas. The history of Goa since 1639 has been one of decay. During the next hundred years it gradually lost all its significance, except as an ecclesiastical metropolis. It might truly have been called a city of dissipation and churches, as Captain Hamilton declares there were over 80 churches and convents, and 30,000 priests.

From 1739 to 1835 the country was at intervals invaded by the Mahrattas and Bhonslas with more or less success.

In 1852 the Ranis of Satari revolted, and in 1871 a rebellion broke out among the native army.

In 1896 the Satari chiefs again revolted, but were suppressed after a few months.

The ruins of many beautiful churches are still standing, and many of them are kept in good preservation.

The church of Bom Jesus, containing the magnificent tomb of St. Francis Xavier, is in excellent preservation, and contains many fine paintings.

The place is well worth a visit, but a description of it would be too long, and perhaps out of place in this book.

A small jetty has been built at Panjim, and small vessels can lie

alongside at all states of the tide. Steamers drawing more than 10 feet cannot go up the Mandavi River to Panjim, but must anchor off Aguada.

There is a considerable trade, and the port is frequented by many native craft, besides being a regular port of call for Shepherd and Company's daily mail service of steamers to Bombay and the coast.

The exports are valued at 1,500,000 Rupees, and the imports at 2,200,000 Rupees.

It is high water, full and change, at 10 hours 39 minutes; springs rise 6 feet, neaps 4 feet.

The Flagstaff is on Panjim Hill, immediately south of which is the Pilot's Tree.

Between Panjim and Aguada there is another flagstaff on the Reis Magos Fort.

Aguada Head Lighthouse, in Latitude $15^{\circ} 29' N.$, Longitude $73^{\circ} 46' E.$, situated on a hill in the Aguada Fort. It is a revolving white light of the 1st order, illuminating an arc of 360° , and is visible in all directions seaward.

It revolves in 1 minute 50 seconds, and is elevated 280 feet above high water level. It can be seen 20 miles in clear weather.

In the *N.W.* bastion of the fort there is a signal station with a flagstaff.

Strangers to Panjim should take a pilot, who may be obtained off Aguada Head on displaying the usual signal.

From Aguada Headland to Rairi Point there are no dangers outside the 6 fathom line, which is about a mile from the shore.

There are two small rocks to be avoided, both just inside the 5 fathom line.

Rairi Rock is one mile *S.S.W.* of the point of the same name. It is 36 feet high, and steep to, with 5 fathoms close alongside.

Havelock Rock, dry at low water, is a sharp pinnacle, with 5 fathoms close to. From the rock Tirakul Fort is *E.* $\frac{3}{4}$ *N.* and Rairi Rock *N.W.* $\frac{1}{2}$ *N.*

Vingorla Rocks, or Burnt Islands, consist of a group of islands and sunken rocks, extending 3 miles in a north and south direction, and one mile east and west.

The highest is called Vingorla Rock, and is 140 feet high.

The southernmost danger is Tapti Rock, with 5 feet of water on it, and lies with the Lighthouse bearing *N.W. by N.*, and the summit of the highest rock *N.N.E. $\frac{1}{2}$ E.*

The Light, in Latitude $15^{\circ} 53' N.$, Longitude $73^{\circ} 27' E.$, is situated on the north-west extreme of the large island, $\frac{1}{10}$ of a mile South of Vingorla Rock.

It is a fixed, white, dioptric light of the 4th order; the light is visible between the bearings *S. $15^{\circ} W.$* , through East, to *N. $75^{\circ} W.$* , and can be seen 16 miles in clear weather.

The Lighthouse is a white masonry tower, erected on a large square building, standing 132 feet above high water level.

Vingorla, or **Vengurla**, is a seaport of some importance.

The Dutch had a settlement here in 1638.

The town was burnt by the Mughals in 1675, and the chief of Sawantwari seized and plundered the Dutch factory in 1696. He in his turn was attacked and routed by the pirate Angria. The first British factory established was in 1772, and in 1812 the town was ceded to the British by the Rani of Sawantwari.

The Lights, in Latitude $15^{\circ} 51' N.$, Longitude $73^{\circ} 36' E.$, are situated on Vengurla Point, one mile West of the town, and are two white, fixed lights, illuminating an arc of 180° , visible from *S. $18^{\circ} E.$* through *E.* to *N. $18^{\circ} W.$* , and can be seen 9 miles in clear weather. They are not shown between the 15th June and the 1st September. The lights are placed vertical, 20 feet apart.

The masts are 371 and 350 feet respectively above high water level, and are shown above the roof of a white masonry house.

The port is visited by a large number of native craft, and it is a regular port of call for the Shepherd Line of Steamers, both by the daily steamer and the bi-weekly steamer to and from Mangalore.

The British troops stationed at Belgaum are usually landed and embarked here in the trooping season.

The **South Rock** lies $\frac{1}{2}$ a mile *S. $\frac{1}{4}$ E.* from Vingorla Point, and has only 10 feet of water on it; and *S.W.* of this rock there are two shoal patches with 17 and 15 feet respectively, and 5 fathoms close to all round.

The **East Rock** has 6 feet of water over it with 4 fathoms close around, and is a $\frac{1}{4}$ of a mile *N.E. $\frac{3}{4}$ E.* from South Rock, and midway between this rock and Vingorla Point there is another shoal with 15 feet of water over it, and 5 fathoms close around.

South-West Point Rock, with only 4 feet of water over it lies $\frac{1}{4}$ mile West of Vingorla Point.

The anchorage is all clear with the exception of these rocks, and the best position for a large steamer is in $5\frac{1}{4}$ fathoms, mud, and good holding ground on the following bearings:—

| | | | | | | |
|-----------------------|--------|--------------------|---|---|--------------------|-------------|
| Flagstaff | - | - | - | - | N. 34° E. | } magnetic. |
| Custom House and Pier | in one | N. 56° E. | | | | |

The small steamers can anchor closer in on the latter bearing opposite the pier.

It is high water, full and change of the moon, at 11 hours 13 minutes; springs rise $6\frac{3}{4}$ feet, neaps $5\frac{1}{2}$ feet.

The principal exports are cocoanuts, coir, kaju, and jaggery, valued at 550,000 Rupees.

The imports consist principally of piecegoods, yarn, twist, sugar, petroleum, etc., valued at 350,000 Rupees.

A quarter of a mile *S.W.* of Nuti Point there is a sunken rock known as Bubra Rock.

A black buoy is moored in 6 fathoms close to the *S.W.* side of this rock during the fine weather season.

Large steamers passing outside Vingorla Rocks should not shoal into less than 15 fathoms.

The channel between the islands and rocks and the mainland is $2\frac{1}{4}$ miles broad, with depths varying from 7 to 9 fathoms.

Entering this channel from the northward, Tiger Hill, open to the southward of Nuti Point, bearing *E.* $\frac{1}{4}$ *S.*, leads into the fairway clear of the northernmost of the Burnt Island group, named Karil Rock. It is a peaked rock, 90 feet high.

When all the islands and rocks bear westward of south, alter course to pass just outside the black buoy, and thence to the anchorage.

Between Vingorla and Malwan, with the exception of the channel just mentioned, the coast is dangerous, and the foul ground in places extends out as far as the 10 fathom line, and $2\frac{1}{2}$ miles from the shore, and the smallest vessels should not come nearer than 3 miles.

A red buoy, moored in 9 fathoms of water, marks the Chaldea Rock, near the south end of the foul ground, off the mouth of the Karli River.

Square Rock, 40 feet high, is the westernmost visible danger of this group of rocks, and lies $4\frac{1}{4}$ miles N. 47° W. from Nuti Point,

and $3\frac{1}{2}$ miles *N. 5° W.* from the northernmost island of the Burnt Island group.

Mandel Rock, 18 feet high, $2\frac{1}{4}$ miles *N. 5° E.* from Square Rock, stands on the western edge of another patch of foul ground, $\frac{3}{4}$ of a mile in extent, with irregular soundings some distance to the westward.

Malwan Rock, with only 8 feet of water over it, lies *N. 78° W.* $1\frac{1}{2}$ miles from Mandel Rock, and from its centre Vingorla Rocks Lighthouse bears *S. 11° E.*

Malwan. The town and port of Malwan, in Latitude $16^{\circ} 3' N.$, Longitude $73^{\circ} 28' E.$, is in a bay almost entirely blocked by rocky reefs, and there were formerly three islands.

On the larger of the two outer islands was the famous fort of Sindhudrug, and on the smaller the ruined fort of Padmagarh.

On what was once the inner island, but now part of the mainland, stands the old town of Malwan; the modern town has spread beyond the old limits.

Rajkot Fort is on the northern side of the bay, about $\frac{1}{2}$ a mile from Sindhudrug, and is built on rising ground, surrounded by the sea on three sides. It was a stronghold of the Mahratta pirates, who were completely extirpated by Colonel Smith in 1812, when Malwan was ceded to the British by the Rajah of Kolhapur.

There is excellent anchorage for small steamers and country craft in the bay between these two forts. Strangers should always take a pilot as local knowledge is necessary.

This port is frequented by native craft, and the steamers belonging to Shepherd and Company call here daily.

On the north side of the fairway leading into the bay there are three black buoys, and about midway between the two outer buoys there is a rock on which stands a perch surmounted by a red cage.

A short distance *S.E.* of this perch a light-boat is moored in 16 feet of water.

There is also a red buoy moored in 8 fathoms of water, $\frac{1}{10}$ of a mile to the westward of Johnston Castle Rock. This rock has only 6 feet of water over it with 4 to 5 fathoms close around, and lies *S. 78° W.* $\frac{1}{2}$ a mile from the north end of Sindhudrug Island.

LIGHTS.—The fixed, green light is shown from a white mast on the beach, 230 yards north of White Stone Cross Melundi Harbour,

at an elevation of 20 feet above high water level, and can be seen 2 miles.

It is visible between the bearings *S. 67° E.* and *N. 22° E.* on one quadrant only.

The fixed, red light is shown from a small native craft, fitted as a light-vessel, and situated to the *S.E.* of the rock at the entrance.

The light is 20 feet above high water level, and is visible 4 miles in clear weather.

These lights in one bearing *N. 73° E.* lead into the anchorage in Malwan Bay.

The trade is small and has been diverted to Vingorla.

The deep water anchorage off the bay is with the north end of Sindhudrug bearing east.

Between Malwan and Dewgad is the island of Kura, 40 feet high, the largest of a cluster of rocks $1\frac{1}{4}$ miles *N.W.* of the Sarjekot River, and $\frac{3}{4}$ of a mile from the shore.

The channel between these rocks and the main is safe, having depths varying from 4 to 6 fathoms.

Dewgad, or Deogarh, has a safe and beautiful land-locked harbour, which is at all times perfectly smooth with an average depth of 18 feet. The entrance, which is $\frac{3}{10}$ of a mile wide, is close to the Fort Point from which rocks project a considerable distance.

The fort is said to have been occupied by the Mahratta pirates 175 years ago; it was captured by Colonel Imlak in 1818.

Vessels proceeding into Dewgad Harbour should bring the summit of Saddle Hill to bear *E. $\frac{1}{4}$ N.* and steer in on that bearing until past the fort, thence steer to the *S.E.* and anchor in 18 feet water with the Fort Point bearing *W.*, and Green Point *S.*

Vessels drawing less than 12 feet may anchor farther to the southward where the water is generally smooth.

Care is necessary when proceeding in Dewgad Harbour to avoid the rocks which extend from the north entrance point.

The best anchorage is in 18 feet, mud, $\frac{1}{10}$ of a mile from the base of the fort with the point bearing *W.N.W.*

It is high water, full and change, at 10 hours 13 minutes; springs rise 9 feet, neaps 7 feet.

The port is largely frequented by native craft, and by the daily steamers belonging to Shepherd and Company.

The exports are valued at 176,000 Rupees, and the imports at 160,000 Rupees.

Viziadrug, in Latitude $16^{\circ} 33' N.$, Longitude $73^{\circ} 19' E.$, is one of the best harbours on the West Coast of India, being without any bar. It may be entered in all weathers, and vessels may anchor anywhere in the harbour during the fine season in from 6 fathoms to 12 feet. The river is navigable for small vessels for more than 20 miles from the entrance.

The fort is one of the strongest Muhammedan fortresses in the Konkan and is of considerable extent. It is situated on the neck of rocky land that forms the south side of the bay, and rises grandly 100 feet above the river.

Its exact age is unknown, but it was improved by the Bijapur Kings, and about the middle of the 17th century was strengthened by Sivaji. In 1698 it was the head-quarters of the pirate chief Angria, who built a dry dock capable of receiving a vessel of 500 tons, traces of which are still in existence.

The fort surrendered to the English Fleet in 1756, when Colonel Clive took possession, but handed it over to the Peshwa in the same year. It finally passed into the hands of the British in 1818.

Burmana Point, from which a reef extends about a quarter of a mile, is the south entrance point of the harbour, and an old Mahratta Battery stands on the high cliffs to the north-east.

The Flagstaff is situated on Viziadrug Point, 170 feet above sea level.

The port is largely used by native craft, and it is also visited daily in the fine season by Shepherd and Company's steamers.

The best anchorage for large steamers is in 21 feet, low water, mud and clay, with the extremes of the fort bearing from *W.S.W.* to *S.W.*

The small steamers lie close to the shore abreast the landing place.

It is high water, full and change, at 10 hours 16 minutes; springs rise $6\frac{3}{4}$ feet, neaps 5 feet.

There is considerable trade, valued at 2,400,000 Rupees.

The coast between Viziadrug and Jaitapur is clear of all dangers, and may be approached within $\frac{1}{2}$ a mile with perfect safety.

Jaitapur, or **Rajapur**, is a seaport of some importance, and is a place of call for Shepherd and Company's daily steamers.

The town is four miles up the river. The Steamer Company run a launch between Rajapur and the port for the convenience of passengers.

Abreast of the town there is plenty of water from 15 to 24 feet, but only 8 feet on the bar at low water with a rise of 4 to 6 feet.

The bay is extensive with good sheltered anchorage in from 4 to 5 fathoms, and without any dangers.

On the ridge immediately above a cove on the north side of the bay there is a conspicuous stone octagonal tower, 103 feet above high water level.

On the north side of the river, just within the entrance, are the ruins of the old fortress of Yashwantgarh.

It is high water, full and change, in the bay at 10 hours 45 minutes; springs rise $6\frac{1}{2}$ feet, neaps $4\frac{1}{2}$ feet.

The trade of the port is valued at 3,360,000 Rupees.

The Light, in Latitude $16^{\circ} 36' N.$, Longitude $73^{\circ} 19' E.$ is situated on the edge of the cliff at the south point of Rajapur Bay.

It is a fixed, white, dioptric light of the 6th order, visible from $S. 30^{\circ} W.$ through $S.$ and $E.$ to $N. 15^{\circ} W.$, standing 75 feet above high water level, and can be seen 9 miles in clear weather. The light is exhibited from the 10th of September to the 10th of June.

Holi, or Three-Tree Hill, is a conspicuous object on this part of the coast. It is 285 feet high, $1\frac{3}{4}$ miles $E.$ by $S. \frac{1}{2} S.$ from the northern point of Rajapur Bay.

Immediately north of Rajapur Bay there is a dangerous reef just inside the 5 fathom line called the Ambolgarh Reef. The centre of the reef uncovers at low water, from which Musargagi tower bears $S.E.$ by $E. \frac{1}{2} E.$, and Ambolgarh Point bears $N.N.E. \frac{3}{4} E.$

During the fine weather a black buoy is moored in 7 fathoms, $\frac{1}{2}$ of a mile from the western edge of the reef.

The coast from Ambolgarh Point to the entrance to Ratnagiri can be approached with safety, and there are no outlying dangers.

Ratnagiri is a large town, and the port is visited by many native craft, besides being a regular port of call for the daily steamers belonging to Shepherd and Company.

The town is open and faces the sea; the fort stands on a rock between two small bays.

The salt water creek to the south of the fort is only practicable for small native craft.

The landing place is on the east side of the fort, near a small tower opposite the Custom House, but with a strong westerly wind it is better to land at the back of the northern fort.

The best anchorage for large steamers is in 5 fathoms, sand and mud, with the Lighthouse bearing *N.W.* $\frac{3}{4}$ *N.* and the Adawlut *E.* by *N.* $\frac{1}{2}$ *N.* and Shepherd's steamers anchor closer in outside the bar.

In the south-west monsoon, steamers should anchor in Kalbadavie Bay in 5 to 6 fathoms, behind the Mirya Donghur Headland, and close to the rocky cliffs on its north-east side.

A large red buoy marks the western edge of the foul ground at the head of the bay.

About $1\frac{1}{2}$ miles *N.W.* of the headland there is a patch with $5\frac{1}{2}$ fathoms on it and 8 fathoms close to.

Shepherd's steamers call here in the south-west monsoon, and the landing place is connected by road with the town of Ratnagiri.

During the mutiny, troops were landed here during the south-west monsoon.

The flagstaff is close to the Lighthouse on Ratnagiri Headland.

It is high water, full and change of the moon, at 10 hours 40 minutes; springs rise 8 feet, neaps 5 feet.

The principal exports are fuel, fish, and bamboos; and the imports are salt, timber, petroleum, grain, and catechu, valued at 2,200,000 Rupees.

The Light, in Latitude $16^{\circ} 59' N.$, Longitude $73^{\circ} 17' E.$, is situated on the westernmost point of the south and highest bastion of the fort, on Ratnagiri Headland.

It is a fixed, white, dioptric light of the 6th order, visible seaward from *N.* 17° *W.* through North and East to *S.* 3° *W.*, standing 320 feet above high water level, and visible in clear weather 15 miles. The tower is built of masonry, painted white.

Most of the large native craft for Ratnagiri go up the Sirgaum creek, the entrance to which is just to the north of Meria Donghur Headland.

There is an old flagstaff on Meria Peak, 465 feet above high water, which must not be mistaken for the Ratnagiri signalling station.

From Neori Point to Jaygad Headland the coast is safe to approach, and there are no outlying dangers.

Jaygad, or Jaigarh, "Fort Victory," is a seaport, in Latitude $17^{\circ} 18' N.$, Longitude $73^{\circ} 14' E.$, situated at the southern entrance to the Shastri or Sangameswar River.

The harbour forms a bay 2 miles long and 5 miles broad with deep water and well protected. It is tolerably easy of access even during the south-west monsoon.

The Light, in Latitude $17^{\circ} 18' N.$, Longitude $73^{\circ} 11' E.$, is situated on the headland and is an occulting, white, dioptric light of the 5th order, every 25 seconds, thus—light 20 seconds, eclipse 5 seconds, visible seaward from south, through east to north, standing 134 feet above high water level, and can be seen 13 miles in clear weather.

There is also a fixed, red, port light on the northern bastion of Jaigarh Fort, about $1\frac{3}{4}$ miles eastward of Jaigarh Headland Lighthouse. It is visible about 5 miles and is intended as a guide to vessels making the anchorage.

The fort, which is in good repair, is situated close to the shore on gently rising ground, about 200 feet above sea level. It was originally built by the Bijapur kings, and was afterwards the retreat of a noted Hindu pirate, the Naik of Sangameswar, who was powerful enough to resist two expeditions of the Portuguese and native forces sent against him in 1588 and 1585.

In 1713 the place passed into the hands of the famous pirate Angria; and in June, 1818, on the downfall of the Peshwa, was surrendered to the British.

The principal exports are firewood and jaggery, valued at 350,000 Rupees.

The imports are principally rice, salt, petroleum and ordinary bazaar cargo, valued at 540,000 Rupees.

It is high water, full and change of the moon, at 10 hours 16 minutes; springs rise 8 to 9 feet, neaps $6\frac{1}{2}$ to $7\frac{1}{2}$ feet.

The deep water anchorage is with the Lighthouse on Jaygad Headland bearing $S. 79^{\circ} W.$ magnetic, $\frac{1}{2}$ mile distant in 29 feet low water spring tides.

Vessels drawing 15 feet or less can anchor in Damankul Bay, with the headland bearing $S. 73^{\circ} E.$, magnetic.

The landing place is near the fort, off which the small steamers can anchor in 30 feet of water.

The shoalest part of the bar, which extends in a *N.N.E.* and

S.S.W. direction, is about $\frac{3}{4}$ of a mile long by a $\frac{1}{4}$ of a mile broad, with from 7 to 12 feet of water over it. There are channels both to the north and south of the bar with 16 to 18 feet of water respectively at low water. The southern channel is more generally used as there are no good leading marks for the other channel.

Kardeshwar Point should not be approached within $\frac{1}{2}$ a mile, as there are several rocky shoals lying off the *N.W.* shore of Jaygad Headland.

When Kardeshwar Temple bears *S.* and Jaygad Fort *E.* by *S. $\frac{3}{4}$ S.*, steer for the fort on that bearing, passing the East point of Damankul Bay about $\frac{1}{4}$ of a mile off, and then steer close under the fort, and when the fort bears *S.* the bar has been crossed.

The best anchorage inside is $\frac{1}{4}$ of a mile from the shore with the lower walls of the fort *N. 32° W.*, magnetic, and the sandy point on the *N.* side of the river *N. 56° E.*, magnetic, distant about $\frac{3}{4}$ of a mile.

The port is frequented by native craft, and there is daily communication by Shepherd and Company's steamers.

The river, which 45 years ago was navigable for the largest vessels to the Sangameswar quay, is now blocked about six miles lower down. The river is tidal for about 28 miles, and 18 miles from Jaygad three other considerable streams run into it. There are many large villages on its banks, and the boats pick up passengers and bring them to the daily steamer.

The Bombay Steam Navigation Company run a steam launch from Rai and Fungus in connection with their steamer service.

A small Hindu Temple known as Boria Pagoda, 360 feet above sea level, and situated $6\frac{1}{4}$ miles *N.* of Jaygad Headland, is a conspicuous object from seaward.

Tolkeshwar Bluff may be known by the Lighthouse on its summit. There is also a flagstaff and an ancient Hindu temple with three pagoda-like cupolas.

At the foot of the point there is a remarkable pinnacle rock, 20 feet high. About $\frac{3}{4}$ of a mile to the eastward of the temple there is an old fort which was one of Sivaji's strongholds.

The Light, in Latitude $17^{\circ} 34' N.$, Longitude $73^{\circ} 8' E.$, is situated on the point on the south side of the entrance to the Washistri River, and is a white, fixed, dioptric light of the 5th order, visible seaward from *N. 15° W.* through *E.* to *S. 17° E.*, standing 333 feet above

high water level, and may be seen 15 miles in clear weather. The light is exhibited from an iron column with a house at the base, which is painted white. This Light is exhibited from the 16th September to the 15th of June.

Dabhol is of considerable historical importance and was the principal port of the Southern Konkan from the 14th to the 16th centuries, carrying on an extensive trade with the Red Sea and Persian Gulf ports.

It is also noted for its beautiful mosque, which is the only specimen of pure Saracenic architecture in the Southern Konkan.

It was the capital of a province of the Bijapur Kingdom under Yusaf Adil Shah, which included nearly the whole of the Ratnagiri District.

The Washistri River is navigable for small boats for 25 miles from the entrance to the town of Chiplun.

The port of Dabhol is situated about two miles from the entrance to the river.

The land on both sides of the entrance to the river is high. The river is narrow, but deep, with no dangers inside the bar.

The Choorpulti sand spit extends from the entrance right up to the Bandar.

A red buoy marks the Western extremity of the bank, and is moored in $2\frac{1}{2}$ fathoms in the fine season only.

It is high water, full and change, at 10 hours 40 minutes; springs rise 8 to 9 feet, neaps 6 feet.

Pir Balu, a conical hill, 821 feet high, having on its summit a dome-shaped tomb, is 4 miles eastward of Dabhol, and forms an excellent landmark when approaching the port.

There are two small leading lights for the Dabhol anchorage ground.

The green light is situated on the northernmost point of Anjenval Fort, and is visible 5 miles.

The red light is shown from the West end of the Dabhol Bandar, in Latitude $17^{\circ} 35' N.$, Longitude $73^{\circ} 10' E.$, and is visible 4 miles. These lights are exhibited in the fine season only.

There is 13 to 14 feet of water, at low water, in the channel over the bar between the South end of the sandbank and Tolleshwar Point.

Shepherd's steamers lie alongside the wharf, and there is good anchorage to the south-east of the landing stage.

There is a considerable passenger trade, and the Bombay Steam Navigation Company run a steam launch in connection with their service of steamers to the principal places between Dabhol and Chiplun.

There are sufficient boats and men for the requirements of the port.

The cost of working cargo is from $2\frac{1}{2}$ to 4 Annas a ton, and landing and shipping costs from 12 Annas to $1\frac{1}{2}$ Rupees per ton.

The principal exports are, jaggery, forest produce, and ground nuts, valued at 2,600,000 Rupees.

The imports are principally salt, rice and ordinary bazaar cargo, valued at 1,700,000 Rupees.

About 2,500 vessels enter the port annually.

The port is under the charge of an officer in the Salt Department.

Hurnai is 15 miles from Dabhol, and is a small town in a bay to the south of the Savaradrug Fort. The small coasting steamers belonging to Messrs. Shepherd and Company call here daily.

The anchorage is about $\frac{3}{4}$ of a mile from the Savaradrug Fort, bearing *N. 11° E.* magnetic, in 16 to 18 feet, mud and clay, and good holding ground.

Between Dabhol and Bankote there are no dangers beyond the 5 fathom line of soundings, which extend from $1\frac{1}{2}$ to 3 miles from the shore.

The Light, in Latitude $17^{\circ} 48' 30''$ *N.*, Longitude $73^{\circ} 4' 45''$ *E.*, is situated on Hurnai Promontory. It is a red, occulting light, thus—visible 8 seconds, eclipse 2 seconds. It is visible 6 to 7 miles in clear weather from *S.S.E. $\frac{1}{4}$ E.* through East and North to *N.* by *W. $\frac{3}{4}$ W.* It is exhibited from a white tower elevated 95 feet above high water.

Bankote, in Latitude $17^{\circ} 58'$ *N.*, Longitude 73° *E.*, is situated at the mouth of the Savitri River. It is frequented by native craft and the small steamers belonging to Shepherd and Company visit the port daily.

The entrance to the river may be recognised by a dark conical hill named Harihareshwar projecting into the sea on the northern side of the bay, and also by the high walls of Fort Victoria, 467 feet high, on the southern side of the river.

A high monumental pillar in the English cemetery is visible from outside the bar.

The fort, previously known as Himitgarh, surrendered to the British in 1756, immediately after the capture of the Savaradrug Fort.

It is high water, full and change, at 10 hours 37 minutes; springs rise $9\frac{1}{2}$ feet, neaps $7\frac{1}{2}$ feet.

The anchorage is just outside the bar, in 4 to 5 fathoms, but small steamers can go inside the river at high water.

There is a formidable sand bar with only 7 feet of water on it at low water spring tides. Its outer edge is marked in the fine season by a black and white nun buoy, and another black and white buoy is moored in 4 fathoms off the end of the spit on the northern side of the river. These buoys should be left on the port hand on entering.

The mouth of the river is formed by bluff hills jutting out on either side of the creek into the sea.

The white obelisk on Panbruj Fort, and a white obelisk on the slope of a hill on the north bank, 2 miles above the point, in line, bearing *N.E.* by *E.* $\frac{1}{4}$ *E.*, lead over the deepest part of the bar.

The bar is dangerous, and the channel should not be attempted by strangers without a pilot.

The Savitri River is navigable for native craft as far as Maprol, 24 miles from the mouth, but higher up the navigation is difficult and there are numerous reefs and rocky ledges between Maprol and Dasgaum.

The Steamer Company run a steam launch on the river for the convenience of their passengers.

The next port of call for Shepherd and Company's steamers is **Shrivardhan**, a small port in a bay of the same name, about $2\frac{1}{2}$ miles north of Devgad Point.

The place is noted for a superior kind of areca-nut which is highly valued at Bombay.

The trade of the port is valued at 72,000 Rupees.

Shrivardhan was a place of consequence under Ahmednagar, and afterwards under the Bijapur kings in the 16th and 17th centuries.

The anchorage is abreast of the town in $3\frac{1}{2}$ to 4 fathoms.

Shah Jehan Shoal, with 15 feet water over it and 4 fathoms close to, lies one mile south-west of Kumbam Point.

Janjira Harbour is the principal port of the native state of Janjira, within the political agency of Colaba. The state has an area of about 325 square miles.

The name is corrupted from the Arabic "jazirah," an island.

The origin of the ruling family is worth relating. About the year 1489 an Abyssinian in the service of the king of Ahmednagar, disguised as a merchant, obtained permission from the chief of the island to land 300 boxes. Each of these boxes contained a soldier, and by this means they possessed themselves of the island and fort of Danda Rajapur.

The island afterwards formed part of the dominions of the King of Bijapur.

The Admiral of the Bijapur fleet was always an Abyssinian, and in 1660 the Sidi Admiral in charge of the island turned traitor in consequence of harsh treatment, and transferred his allegiance to the Mughal Emperor Aurangzeb.

Janjira was repeatedly attacked by Sivaji, but was never captured, and is noted for being the only state in Western India that successfully resisted the attacks of the Mahrattas.

The present Nawab is an Abyssinian, and is entitled to a salute of ten guns. He also governs the small state of Jafarabad in Kathiawar.

There are about 600 people in the State of Janjira of Jewish descent, known as the Beni Israel. They practise most of the Jewish rites, worship one God, and have no images. They speak Marathi. Their dress and manner of living are partly Muhammedan and partly Hindu.

They are oil-pressers by trade, and though fond of drink, are prosperous, steady, and enterprising.

The Daldis are fishermen, and they supply the crews of many of the Bombay boats, and man the steamers of the P. and O. and other large lines, besides the small coasting steamers.

The state maintains a small force of about 700 men. It enjoyed independence till 1868, there being no Political Agent, and no interference with its affairs, but the administration of the state about that time was so bad the British Government had to interfere, and a treaty was made with the Nawab in 1870.

The Fort of Janjira, on an island at the entrance of the Rajpuri Creek, lies $\frac{1}{2}$ a mile from the mainland on the east, and about one

mile on the west. The walls of the fort rise abruptly from the water's edge to a height of 50 feet. On the walls, which are battlemented and loopholed, ten guns are mounted. The fort was built in 1707 A.D. A large Muhammedan fair is held in the fort every year in November.

Rajpuri Point forms the north extreme of the peninsula on the southern side of the entrance.

The hills are 600 to 800 feet high.

Light, in Latitude $18^{\circ} 17' N.$, Longitude $72^{\circ} 56' E.$, is situated near the village of Nanowli, on Rajpuri Point, near the extreme.

It is an occulting, white, dioptric light of the 4th order, obscured 5 seconds once in every 15 seconds, visible from $S. 35^{\circ} W.$, through south and east to $N. 4^{\circ} W.$, standing 179 feet above high water level, and can be seen 18 miles in clear weather. The column is built of stone; and is painted white.

There is a reef $1\frac{1}{4}$ miles from the Lighthouse known as Whale Reef, or to the natives as Chor Kassa.

From this reef shoal water extends $\frac{1}{2}$ a mile in a westerly direction, and $\frac{4}{10}$ of a mile in a southerly direction.

A red buoy is moored on the north side of the reef on the following bearings :—

| | | |
|--------------------|--------------------|-------------|
| Rajpuri Lighthouse | N. 74° E. | } magnetic. |
| Kansa Fort | N. 19° E. | |

Yoor Point is the extreme point on the northern side of the harbour, and there is foul ground along the cliffs to the *N.E.*, extending $\frac{4}{10}$ of a mile from the shore.

Kansa Fort is $1\frac{1}{2}$ miles *S.S.E.* from Yoor Point.

It was built in 1693, and is now in ruins.

Marad is the principal town, and is situated on the northern side of the creek.

On the southern side of the creek there is a stone pier used by the passengers of the coasting steamers in the north-east monsoon.

It is high water, full and change, at 10 hours 47 minutes; springs rise 14 feet, neaps 8 to 10 feet.

The port is easy of access, and no pilot is required.

There are numbers of fishing stakes in the harbour to be avoided, and most of them are above water.

Large steamers must anchor outside the harbour.

The best anchorages for smaller steamers are as follows :—

In 22 feet of water (low water springs)—

| | | |
|------------------------|-----------|-------------|
| Tree on Janjira Fort . | N. 31° W. | } magnetic. |
| Extreme Sandy Point . | S. 85° E. | |

or in 20 feet (low water springs)—

| | | |
|-------------------------|------------|-------------|
| Tree on Janjira Fort . | North. | } magnetic. |
| Extreme Sandy Point . | S. 66½° E. | |
| Extreme Rajpuri Point . | S. 79° W. | |

Port dues are 1 Anna per registered tonnage for 30 days.

Fresh provisions are obtainable, and are good and cheap.

There are sufficient boats and men for the requirements of the port.

The principal exports are timber, firewood, salt and manufactured cloths.

Imports are principally bazaar cargo from Bombay, rice, salt, petroleum, etc.

The entire trade is valued at 3,000,000 Rupees.

The port is visited by many native craft, and it is a regular port of call for Shepherd's daily service of steamers.

Rewadanda, in Latitude 18° 32' 30" N., Longitude 72° 54' E., is situated at the mouth of Kundalika River. The harbour is small, but safe, and has plenty of water varying from 4 to 7 fathoms. The town has many interesting remains of the Portuguese, especially the walls and fort of Korlai surmounted by a tower. The bar has only 8 feet of water on it. There is a small native trade, and during the fine season Shepherd's steamers call here daily.

It is high water, full and change, at 11 hours ; springs rise 10 to 12 feet, neaps 7 to 8 feet.

At the entrance to the river there are two forts : Korlai Fort to the south, and Rewadanda Fort to the north.

Foul ground extends ½ a mile to the southward of Korlai Point. The 6 foot patch is 2 miles N. 64½° W. from the north point of Korlai, and the 9 foot patch is ⅙ of a mile N. 22½° W. from the 6 foot patch.

The Hingladevi Temple ½ mile N.E. of the port is a conspicuous object, from the dazzling white appearance of the buildings.

The shoalest part of the sandbank, lying to the southward of the channel over the bar, is 1 mile N. 68½° W. from the north point of Korlai Headland, and nearly a mile S. 64½° E. from the 6 foot patch.

The small coasting steamers go between Korlai Point and this sandbank.

The leading marks over the bar are a Muhammedan tomb, 421 feet high, and a small pole and ball beacon, painted white, $\frac{3}{4}$ of a mile north of Rewadanda Fort in line.

The landing place and anchorage are off the sandy point to the east of the fort.

The small coasting steamers bound to Alibagh go between the mainland and the Chaul Kadu Reefs.

Alibagh is a small town and port with a small native trade. It is in daily communication with Bombay and the coast by means of Shepherd's steamers. The town was named after a rich Muhammedan, who improved the town in the 17th century.

On entering the harbour the town is completely hidden in groves of cocoanut palms.

At the entrance to the creek there is an ancient fortress known as Kolaba. The reef on which the fort is situated is joined to the mainland at low water.

There is a small European station at Alibagh.

A lifeboat is stationed at Alibagh. The signal station and flag-staff are in the fort close to the landing place.

The Light, in Latitude $18^{\circ} 38' N.$, Longitude $72^{\circ} 51' E.$, is shown from a staff in the fort signal station. It is a fixed, green light, standing 32 feet above high water level, visible for 3 miles in clear weather between the bearings $N. 67^{\circ} E.$ through North to $N. 22^{\circ} W.$

The steamers anchor off the entrance to the creek, under the fort. The rocks under the fort are generally marked by a stake.

There is a depth of 12 feet (low water springs) with this stake in line with Undari Island, and the lifeboat house at Alibagh in line with the sharp peak (Parhur) of the Hummocks of Thal.

Chaul Kadu Reefs are $3\frac{1}{2}$ miles from the shore, and $4\frac{3}{4}$ miles $N.W.$ of Korlai Point, and about $1\frac{1}{4}$ miles in extent running north and south.

The Northern Patch is marked by a circular stone beacon, 60 feet high, and 20 feet in diameter with a refuge chamber to which there is access by an iron ladder.

This beacon may be passed only on the $N.E.$ and East sides at $\frac{1}{10}$ mile distance.

Stop, something }
 important to } Pendant, over a ball, above a square flag.
 communicate. }

Also, that the following signal may be made by vessels :—

Aground want as- { Square flag over a ball; one gun, and after
 sistance. { an interval of one minute, two guns with an
 interval of five seconds between them.

Undari (Henery) Island is $1\frac{1}{2}$ miles *E.* $\frac{1}{2}$ *N.* from Kenery Island, and one mile from the shore. There are rocks to the westward of the island, and those to the southward nearly join the reef off the mainland.

It is not safe to approach nearer than one mile on the southern side.

BOMBAY is the capital of the Presidency of Bombay, and the principal seaport of Western India, in Latitude $18^{\circ} 54' N.$, Longitude $72^{\circ} 49' E.$

The popular idea is that the town was formerly called Buon Bahia, or “fair haven,” and this is supported by the fact that it possesses one of the finest harbours in the world.

This is, however, incorrect, and from the evidence of the best authorities which cannot be doubted the true derivation is from the Mahratta “Mumbai,” namely “Mahima, the great mother.” Colonel Yule traces it back to 1516 when the town was called Mayamba.

It may be noticed as a curious fact that our two greatest cities in India, Bombay and Calcutta, are called after titles of the same goddess, the wife of Siva, the lord of death and reproduction.

Bombay was known to the Arab Geographers in the 9th century. The Portuguese appeared on the scene and established themselves in Bombay in the early part of the 16th century.

In 1611 Bombay was given by the Portuguese to Charles II. as part of the dowry of his Queen, Catherine of Braganza.

The King transferred the property to the East India Company in 1668, on payment of an annual rent of £10 sterling. The Company set to work immediately to improve the town, and strengthen the fortifications. Bombay was at that time an island and there was a large stretch of sea between Parel and Mahim. The Portuguese had settled themselves at Salsette, and did all they could to annoy the English, and were able to cut off all communications with the mainland. Our greatest enemy though was the Sidi Admiral

of Janjira, the descendants of whose men now man most of the boats in Bombay Harbour, as well as the fleets of the P. and O., B.I., and other large companies.

In 1668 the Admiral took up his quarters at Mazagon, and laid siege to Bombay Castle, and the town was only saved by the Emperor Aurangzeb's interference in our behalf.

Bombay became the principal seat of the East India Company's trade in 1687, when the headquarters were transferred from Surat, where the English had been established since 1601 A.D. It was not until 1773 that Bombay was subjected to the control of the Governor General.

The permanent occupation of the British of all the group of islands, including Bombay, and Thana on the mainland, took place after the Mahratta war, which was concluded in 1782.

After the downfall of the Peshwa in 1818, Bombay became the centre of a huge territory, and from that time has grown and prospered until she has become one of the most magnificent cities in the world. Bombay is unsurpassed by any of the eastern cities, either in the beauty of its scenery or the commercial advantages of its position, and on entering the harbour one is impressed with the magnificent panorama and picturesqueness of the scene stretched out before one's gaze.

The city stands on Bombay Island, which is connected by railway embankments and a causeway on the north with the larger island of Salsette, and so continuously with the mainland.

At the last census the population amounted to over 800,000, consisting of representatives of nearly every nation in the world.

The Harbour is 15 miles long, *N.N.E.* and *S.S.W.*, and 4 to 6 miles broad, with general depths of 4 to 6 fathoms, the bottom generally consisting of mud.

Outer Light Vessel is moored in $6\frac{1}{2}$ fathoms and is 7 miles *N.* by *W.* $\frac{1}{2}$ *W.* from Kenery Island, and $3\frac{1}{2}$ miles *S.* by *W.* $\frac{1}{2}$ *W.* from the Prongs Lighthouse.

It exhibits at an elevation of 36 feet, a red, revolving light, which attains its greatest brilliancy every 20 seconds, and can be seen 10 miles in clear weather.

The vessel is painted red, has three masts, and carries a red ball at the main, and hoists a red flag in the daytime when a vessel is sighted.

At night she burns a blue light every half hour, from 1st June to 30th September, and every hour from 1st October to 31st May, and displays a torch-light every half hour.

From the Light-Vessel the Sunk Rock Lighthouse bears *N. 35° E.* distant 5 miles, the shoalest part of Thal Shoal *E. by S. $\frac{1}{2}$ S.* distant $2\frac{1}{4}$ miles, and the southern extreme of the foul ground off the *S.W.* Prong *N. $\frac{3}{4}$ E.* distant $2\frac{1}{2}$ miles.

Eastern Shore. At three quarters of a mile within the south entrance point of the harbour there is a hill, 180 feet high, named Thal Knob, having on it a white beacon, 60 feet high; about half a mile south of this hill there is another of rather less elevation named False Knob.

In thick weather these hills stand out well among the trees, being detached from the more distant high land.

At $3\frac{1}{2}$ miles *S.E.* of Thal Knob lies Ashuerra Hill, 922 feet high, having on it two hummocks named the Paps, on the northern of which there is a black beacon, 80 feet high.

An extensive group of fishing stakes lies north and east of Thal Shoal in 32 feet at low water spring tides; this group is removed during the south-west monsoon, but care is necessary to keep clear of its position, which is about half way between Thal Shoal and South Karanga Shoal buoy, as frequently the stakes are broken off short and cannot be seen above water. The line of bearing of this group is about *N.W.* and *S.E.*

Kansa, or Gull Island, 20 feet high, lies at the entrance of Pen River, $2\frac{1}{4}$ miles *N.* by *E. $\frac{3}{4}$ E.* from Thal Knob beacon, and *W.* by *N. $\frac{1}{4}$ N.* $2\frac{1}{2}$ miles from Nocar Point, the south entrance point of the river.

About $\frac{1}{10}$ of a mile *S.W.* of this island there is a knoll with 6 feet water, on which the sea breaks, and at $\frac{1}{4}$ mile south of this island lies a detached rock, dry at low water.

Karanja Reefs extend nearly 2 miles from the western side of Karanja Island, and about 4 miles *N.* and *S.*

On the *N.W.* extreme of these reefs and in 6 feet of water stands a red beacon, 40 feet above low water spring tides.

A red buoy surmounted by a globe is moored in $5\frac{1}{2}$ fathoms, near the west, and a red buoy with triangle in 7 fathoms, near the *N.W.* extreme of these reefs.

Uran Shoal, with 2 feet of water on it, lies about $1\frac{1}{2}$ miles

N.E. $\frac{1}{2}$ E. from Karanja Beacon, and is marked by a circular stone beacon, 84 feet high, painted red.

Western Shore. The principal channel leading into the harbour lies between Prongs Reef and Thal Shoal, and is about $2\frac{1}{2}$ miles wide.

North Pap and Thal Knob beacons, bearing *S.E.* by *E. $\frac{1}{4}$ E.*, lead clear of all foul ground south of Prongs Reef.

On **Prongs Reef** stands a Lighthouse, 146 feet high, from which at an elevation of 136 feet above high water is exhibited a flashing, white light, showing a flash every ten seconds, visible in clear weather from a distance of 18 miles.

The Lighthouse is painted white, red, white and black horizontal bands, and is connected by telegraph with Bombay.

Kolaba Shoals extend from the Prongs Reef, along the East side of Kolaba for about 3 miles, and project in some parts nearly a mile from the shore. On the outer edge of these shoals, abreast the south extreme of Kolaba, lies a five feet knoll with depths of 8 to 13 feet close around.

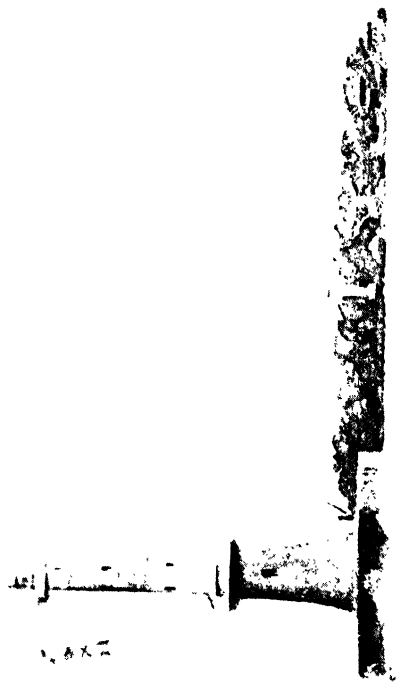
Sunk Rock. At half a mile east of the 5 feet knoll there is a shoal 4 cables long, *N.N.W.* and *S.S.W.*, and one cable across its broadest part, with 5 to 18 feet water, and deeper water close around. On the northern portion of this shoal lies Sunk Rock, which is awash at low water, and between which and the outer edge of Kolaba Shoals there is a channel nearly 2 cables wide, with 19 to 27 feet of water in the middle.

Sunk Rock Lighthouse, built on the rock, is a black circular tower 95 feet high, from which, at an elevation of 64 feet above high water, is exhibited a red and white light, occulting every five seconds, visible in clear weather from a distance of 14 miles.

The eclipses are from one to two seconds. White between *S. 7° W.* and *S. 30° W.*, red from *S. 30° W.* through west, to *N. 15° E.*, white from *N. 15° E.*, to *N. 31° E.*, and red from *N. 31° E.* to *N. 69° E.*

Dredgings from R.I.M. Dockyard are being dropped between Sunk Rock and Kolaba Shoals, the passage is therefore unreliable.

Oyster Rock is situated three-quarters of a mile *N.N.W.* from Sunk Rock and half a mile from the shore. It is flat, about 70 feet high, about a cable long by half a cable broad, and has a battery on it. A rock named Nigger's Head, with one foot water on



1. 8 X 2

it, lies 2 cables south-west of Oyster Rock. The shoal on which these rocks stand has on it depths of 2 to 6 feet, and 7 to 14 feet close around. The channel between these rocks and the Kolaba Shoals has from 8 to 10 feet of water on it.

Fishing Stakes extend *S.E.* by *S.* from the north end of Oyster Rock for nearly half a mile in 17 to 27 feet. There are intervals between these stakes large enough to allow small vessels to pass through; but care must be exercised in doing so, as the stakes are frequently broken short off just below water.

Kolaba Reef, situated a cable off shore, abreast the Victoria Bandar, and 4 cables north of Oyster Rock, is nearly four cables long *N.E.* by *N.* and *S.W.* by *S.*, with rocks drying from 1 to 3 feet for about half its length. Near its north and south extremes, in 1 and 6 feet respectively, stand circular stone beacons, painted in black and red bands.

Dolphin, a small rocky shoal, which partly uncovers at low water, with 9 to 15 feet close around, and 4 fathoms half a cable east of it, lies *N.* $\frac{1}{2}$ *E.* $1\frac{1}{2}$ miles from the Sunk Rock Lighthouse, and 2 cables east of the North Kolaba Reef beacon.

On Dolphin Rock stands a grey tower 35 feet high, from which, at an elevation of 20 feet above the sea, is exhibited a fixed, white, and green light, visible in clear weather from a distance of 3 miles. The light shows green from *N.* to *W.*; white from *W.* to *S.W.* by *W.*; and green from *S.W.* by *W.* to *S.E.* by *S.*

Middle Ground Shoal, situated *N.N.E.* $\frac{1}{4}$ *E.*, about 2 miles from Sunk Rock, is 2 cables long north and south, and $1\frac{1}{4}$ cables across the broadest part, having near the centre a rocky islet about 40 feet high, on which stands a battery. On the shoal surrounding this islet there are depths of 10 to 18 feet with $3\frac{1}{2}$ to 6 fathoms close around.

A buoy, painted with black and white horizontal stripes and surmounted by a triangle, is moored in $3\frac{3}{4}$ fathoms water, near the north extreme of the shoal.

The University Clock Tower, in line with the Scotch Church *N.W.* $\frac{1}{2}$ *W.*, leads southward, and the clock tower bearing *W.* by *N.* $\frac{3}{4}$ *N.* leads northward of Middle Ground Shoal.

Wellington Patch, or **Tilly Rock**, with 8 feet water, and 10 to 14 feet close around, lies $1\frac{1}{2}$ cables east of the saluting battery.

This is the northern of a series of patches with 5 to 8 feet water connecting with the Kolaba Reef.

Apollo Spit, or Falkland Rock, with 11 feet water and 13 to 16 feet close around, lies *N.W.* by *W.* about half a mile from Middle Ground Shoal at 2 cables *E.S.E.* of the Dockyard Flagstaff.

Flagstaff Shoal, with 8 feet least water and 13 to 24 feet close around, lies *N.* by *W.* $\frac{1}{2}$ *W.* about 6 cables from Middle Ground Shoal, and 4 cables from the shore.

A black buoy with flag is moored on its south-east end in about 23 feet of water.

North Patch, with 11 feet water and 13 feet close around, lies *N.* by *W.* $\frac{1}{4}$ *W.*, one mile from Middle Ground, and 2 cables from South Bori Bandar. A 10 feet patch lies *E.* by *S.* $\frac{3}{4}$ of a cable from the North Patch. A black buoy with globe is moored in 23 feet water at 3 cables *E.* $\frac{1}{2}$ *N.* of this patch.

Cross Island Reef, with 2 feet least water and 12 to 14 feet close around, is about one cable long north and south, and a $\frac{1}{4}$ of a cable across its broadest part. A black buoy with triangle is moored in 24 feet water about $1\frac{1}{2}$ cables east of this reef.

Just west of the line joining this buoy and the North Patch buoy the bottom is very foul, there being several rocky patches of from 7 to 12 feet water.

Nearly 2 cables south-west of Cross Island Reef lies a shoal with 2 feet water, on which stands the South Channel beacon, 36 feet high, and painted in red and black bands. There are depths of 13 feet around this shoal, and also in the channel between it and Cross Island Reef.

Cross (Gibbet) Island, 54 feet high, situated *N.* $\frac{1}{2}$ *E.* $1\frac{3}{4}$ miles from Middle Ground, stands on the east side of a reef of rocks, which dries for a distance of $1\frac{1}{2}$ cables north and west of the island. Shoals extend from this island 4 cables in a south-westerly and $2\frac{1}{2}$ cables in a northerly direction. The southern shoal has depths of 1 to 4 feet, and on its north-west edge, in 5 feet water, stands a tripodal beacon with staff and diamond; between this shoal and the shore there is a narrow passage with 9 to 12 feet water. The north shoal has 3 to 6 feet water, and on its north extreme stands North Channel Beacon 28 feet high, and painted in black and red bands. The reef dries for a distance of $1\frac{1}{2}$ cables north and west of the island.

On the North Channel Beacon a white light is exhibited when the dock gates are open. It is visible from *N.* 40° *W.*, through *W.S.*, and *E.* to *N.* 69° *E.*, and is situated in Latitude $18^{\circ} 57' N.$, Longitude $72^{\circ} 51' 15'' E.$

Fishing Stakes. There are three groups of fishing stakes between Cross Island and Mazagon; the west group lies in 7 feet water, about $\frac{1}{2}$ mile *E.* by *N.* from Mazagon pier, the middle group in 17 to 23 feet water $\frac{3}{4}$ of a mile *E.* by *S.* from the pier; and the east group in 17 to 19 feet water, about one mile *E.* by *N.* from Cross Island.

Tucker Patch, at 2 miles *S.W.* $\frac{1}{2}$ *W.* from Butcher Island, and $1\frac{3}{4}$ miles *N.E.* by *E.* from Middle Ground, is marked by a beacon 42 feet high, and painted in black and red bands. Another patch, distant $2\frac{1}{4}$ cables *N.* by *W.* $\frac{1}{2}$ *W.* from this beacon, is formed of rubble stone, the highest point of which dries 7 feet, and is marked by an iron framework carrying a triangle, the apex of which is 18 feet above high water. There is a shoal with 10 feet water situated one cable east of this beacon.

Butcher Island, 68 feet high, situated 3 miles *E.* by *N.* $\frac{1}{4}$ *N.* from Cross Island, is 4 cables long and $2\frac{1}{2}$ broad. It is surrounded by rocks, which extend to a distance of one mile from its south-western side. Near the centre of the island stands a small tower, and on the south-east end there is a large tree. The rest of the island is occupied by barracks, storehouses and a cemetery.

There is also a pier on the north-east side. About 6 cables south of the island there is a rock with 8 feet of water, and 7 to 9 fathoms a short distance east of it; this rock is marked by a black stone beacon 36 feet high.

Butcher Big Reef is separated from Butcher Island Reef by a channel 2 cables wide, with depths of 7 to 16 feet. The Big Reef is $1\frac{1}{2}$ miles long *N.N.E.* and *S.S.W.*, and half a mile across; the middle part dries from one to 4 feet at low water. A red buoy with globe is moored in 22 feet near the western edge, and a red buoy with triangle in 18 feet near the northern limit of the shoal water off this reef.

Elephanta Island, about one mile east of Butcher Island, is densely wooded, and has on it two hills separated by a deep ravine, the eastern 553 feet, and the western, in which are the celebrated caves about 300 feet high. There is a pier on the north-east shore,

which is the best landing place on the island. There is also a pier on the north-west shore which is used as a landing place for the caves. The end of this pier, which only just uncovers at low water, is marked by an iron tripod with a cage painted black, 10 feet above high water.

Elephanta Rock, having 6 feet at low water springs, lies 2 cables off the south end of Elephanta Island.

Shewa Beacon, a red masonry pillar with a pole and cage on top, is placed on the east side of the channel between Elephanta Island and Hog Island. The height of the cage is 46 feet above low water spring tides.

Barnacle Rock, in the same channel, is marked by a black pillar 30 feet high.

Elephanta Spit is a shoal spit of mud extending *N.N.E.*, $7\frac{1}{2}$ cables from the north end of the island. The end of the spit is marked by a buoy coloured black and white, surmounted by a triangle.

Hog Island lies about three-quarters of a mile east of Elephanta Island on the south side of the entrance to Panwel River. On the north end of the Island there is a lift dock which is now out of repair.

Wet Docks—Prince's Dock. The first stone of this extensive dock was laid by His Majesty the King on the 11th November, 1875, and the dock was open for traffic on the 1st January, 1880.

The dock has an area of 30 acres of water, it is 1,460 feet long, and 1,000 feet wide, with a jetty at the north end, 700 feet long and 240 feet wide. The length of the berthage in the dock is 5,960 feet, and along the outer wall next the harbour 1,590 feet. There are two entrances, the northern 66 feet and the southern 55 feet in width. The depth on the sills of both is $28\frac{1}{4}$ feet at high water ordinary spring tides. The bottom of the dock has been excavated 3 feet below the sills.

There are fifty-one moveable hydraulic cranes for working cargo, capable of lifting 30 cwt., through a height of 60 feet; and at the head of the jetty is a crane which is capable of raising 30 tons; also a 5-ton hydraulic capstan for warping vessels into the dock. There are also two capstans capable of sustaining a strain of 5 tons, and two of 11 tons for warping vessels at the entrances. Eleven closed transit sheds having an area of 331,260 square feet have been erected

on the wharfs, besides nine warehouses with an area of 139,160 square feet. Fresh water is laid along the wharf, and is available from numerous hydrants for ordinary use, and in case of fire.

Victoria Dock, in continuation of Princes Dock, was opened 12th March, 1888. It has an area of 25 acres of water, is 1,270 feet long and 1,000 feet wide, and has three jetties on its western side each 400 feet long and 230 feet wide. The length of berthage in the dock is 7,425 feet. The communication passage with the Prince's Dock is 64 feet wide, closed by a caisson.

The sea entrance is 80 feet wide. At high water ordinary spring tides there is a depth of $30\frac{1}{4}$ feet on the sill. The bottom of the dock is 3 feet lower than the sill.

There are 57 movable hydraulic cranes for working cargo, capable of lifting 30 cwt., through a height of 60 feet; in the south-east corner of the dock is a 20 ton crane, and on the south jetty is a crane which is capable of raising 100 tons through a height of 40 feet. Ten closed transit sheds, having an area of 307,642 square feet, have been erected on the wharves, besides four warehouses with an area of 129,600 square feet.

Sassoon Dock, length 632 feet, width at entrance 40 feet, depth over sill at high water ordinary springs $22\frac{1}{2}$ feet.

Government New Basin has an area of $4\frac{1}{3}$ acres, with an irregular perimeter of 1,892 feet. The length of the berthage is 1,500 feet. The width of the entrance is 60 feet, and the depth of the sill at high water ordinary spring tides is 23 feet. The bottom of the basin has been excavated two feet below the sill.

The **Torpedo Dock** is in the south-west corner of the basin.

| | Graving Docks. | Length over all. | Width of entrance. | Depth over sill at high water ordinary springs. |
|------------|------------------|---------------------|-----------------------|--|
| | | Feet. | Feet. | Feet. |
| Government | Lower Bombay . . | 255 | $51\frac{1}{2}$ | $16\frac{1}{2}$ |
| | Middle „ . . | 183 | 52 | $16\frac{1}{2}$ |
| | Upper „ . . | 199 | $47\frac{1}{2}$ | 14 |
| | Lower Duncan . . | 316 | 60 | 24 |
| | Upper „ . . | 267 | 60 | 24 |
| | New Torpedo . . | $155\frac{1}{2}$ | 25 | 12 |

| | Graving Dock. | Length over all. | Width of entrance. | Depth over sill at high water ordinary springs. Feet. |
|------------|-----------------------------|---------------------|-----------------------|---|
| Mercantile | P. and O. { Old (Mazagon) | 154 | 35 | 10½ |
| | { Ritchie | 495 | 66 | 18 |
| | B.I. Mogul | 413 | 60 | 15½ |
| | Merewether | 557½ | 65½ | 28¼ |
| | Viga's Patent Slip Cradle | 232 | — | — |
| | Hydraulic Lift (Hog Island) | 380 | 80 | 22 |

The two Duncan Docks can be used as one dock, 627 feet on floor with caisson in outer groove and gates open.

The Merewether Dock, which was opened on 3rd March, 1891, is in the north-west corner of the Prince's Dock. The Government Docks are on the west side of the harbour, near the fort. The three Bombay Docks and also the two Duncan Docks can be used as one dock. There is a gridiron adjacent for small vessels.

The Mercantile Docks are about 3½ miles north of the fort.

Dimensions and draught of largest vessels docked in Bombay :—

Prince's Dock. Length of vessel 435 feet, draught 25 feet 6 inches.

Victoria Dock. Length of vessel 465 feet, draught 27 feet 5 inches.

Bombay Docks. Length of vessel 311 feet, draught 15 feet 3 inches.

Duncan Docks. H.M.S. "Serapis," length 380 feet, draught 18½ feet.

Merewether Dock. Length of vessel 412 feet, draught 21 feet 8 inches.

Ritchie Dock. Largest vessel docked, S.S. "Oceana," length 475 feet, and lightened to 18 feet draught.

Mogul Dock. This dock is capable of taking a vessel 350 feet in length, 40 feet beam, and 14 feet draught.

Viga's Patent Slip has taken a vessel of 1,200 tons, and 14 feet draught.

Lifeboat. A lifeboat is kept in readiness close to the Pilot Bandar of Kolaba.

The time signal made at the clock tower (approximate 18° 57' 13" N. 72° 50' 46" E.), at the Victoria and Prince's Dock has been altered, and the ball will in future be dropped at 15h. 0m. 0s. Greenwich

mean time, or 7h. 57m. 15·7s. A.M. Local mean time, in case of failure a flag will be immediately hoisted and the ball be dropped at 16h. 0m. 0s. Greenwich mean time, or 8h. 57m. 15·7s. A.M. Local mean time.

A time ball is dropped by electricity from Kolaba Observatory daily, Sundays excepted, at Bombay Castle at one o'clock P.M. Bombay mean time, or 20h. 8m. 44·3s. Greenwich mean time. Ball hoisted close up 5 minutes before signal. In case of failure of the ball to drop correctly, a flag is immediately hoisted, and the ball is dropped again exactly at 2 P.M. Bombay mean time; but the time of re-dropping the ball will be altered from 2 P.M. to 3 P.M. Bombay mean time, should the ball at the docks fail to drop correctly on the same day. The clock in the time ball tower, having a centre seconds hand, beats every two seconds, by means of an electric current in unison with the clock at the Observatory at Kolaba, and indicates, practically, exact Bombay mean time.

Water—Fresh water is supplied by the port authorities from their steam tank vessel.

Supplies of all kinds are obtainable in Bombay. Coals can be obtained in large quantities from several firms in Bombay, some of which keep in store 2,000 to 20,000 tons, and are supplied in bulk from barges.

Pilots—The direction and management of the port, pilotage, and docks, under the control of the trustees of the port, are vested in the Port Officer. The pilot service consists of 15 licensed pilots.

The pilot schooner is a fore and aft rigged vessel, painted black, with a ribbon or band, 2 inches wide, close above the covering board, and the number in large white figures on each bow. During the day a red and white horizontal flag is hoisted at the foremast head when vessels are in sight; and during the night the usual pilot signal is exhibited. During the south-west monsoon and bad weather the schooner cruises between between Outer Light Vessel, bearing *S.E.*, 2 miles, and Khandari Island bearing *S.E.*, 5 miles; the position between these bearings is known as the Outer Station. In very heavy weather, when the vessel is compelled to leave the Outer Station, she cruises between Sunk Rock and the Outer Light Vessel.

Anchorage—The usual anchorage is on the west side of the harbour abreast the town of Bombay; but good anchorage may be

obtained in any part of the harbour. The anchorage for vessels of war lies between the Castle and the Sunk Rock, and the several moorings are marked by buoys.

All vessels should be moored, as a general rule, *S.S.W.* and *N.N.E.*; there should be 60 fathoms on the south-south-west anchor, and 45 fathoms on the north-north-east anchor. Vessels moored in the eddies off Middle Ground should have 75 fathoms on the south-west anchor, and all vessels should be berthed in a sufficient depth of water to enable them to load their deepest draught without touching the ground, and in a position where they will swing clear of all other vessels, fixed moorings, shoals and buoys.

Vessels arriving without a pilot shall anchor to the eastward of the Sunk Rock Light.

Vessels arriving with or taking in gunpowder should be anchored not nearer than one mile south-east from the Middle Ground.

Vessels arriving with or taking in dynamite, nitro-glycerine or other explosives, shall, in the absence of special orders, be anchored not nearer than one and a half miles south-eastward of the Sunk Rock light.

Vessels remaining below the Middle Ground over 24 hours shall be moored, unless the Commander signifies in writing his readiness to take charge of the vessel at single-anchor.

Quarantine ground—Vessels arriving in harbour which are liable to quarantine under the regulations, or which may be ordered quarantine, shall anchor within the following limits:—Sunk Rock Lighthouse in transit with the Prongs Lighthouse and the Dolphin Lighthouse bearing from *N.W.* to *N.N.W.* in from 32 to 36 feet of water at low water spring tides, and distant from $1\frac{1}{4}$ to 2 miles from Sunk Rock Lighthouse.

Tides—It is high water, full and change, at the Apollo Bandar at 11h. 35m.; at Outer Light Vessel at 0h. 20m.; at Prongs Lighthouse at noon; at Mazagon at 11h. 30m.; at North Karanja buoy at 0h. 30m.; at South Karanja buoy and all along the eastern shore at 0h. 30m. The tide coming out of Pen River is met at Nocar Point, where it is high water, full and change, at 0h. 25m.

In Bombay Harbour springs rise $14\frac{1}{2}$ feet, except at extraordinary springs, when the rise is sometimes as much as 18 feet; neap tides rise $11\frac{1}{2}$ feet. The velocity of strong springs between Thal Shoal and the Prongs is $2\frac{1}{2}$ to 3 knots per hour and 4 knots during the rains. In

the entrance of the harbour the tide does not set fairly through the channel, but the flood stream sweeps over the extremity of the foul ground of Thal Shoal eastward, towards the opening leading past Gull Island to Pen River. During the rains in the south-west monsoon, the ebb sets strong out of Pen River to the westward, which greatly assists vessels in working out of the harbour.

Approaching Bombay from the southward a vessel should not shoal into less than 12 or 11 fathoms between Port Chaul and Khandari Island, as in this vicinity large fishing stakes extend some distance from the coast. When Khandari Island bears southward of East, a course may be steered for the outer Light-vessel, which can be passed at a convenient distance on either side, thence a *N.E. $\frac{1}{2}$ N.* course will lead to the anchorage East of Sunk Rock, or proceed further up the harbour to the usual mooring ground abreast the city. At night the white sector of Sunk Rock Light leads East of the foul ground extending from Prongs Lighthouse.

When Sunk Rock bears *N.W. by W. $\frac{3}{4}$ W.* a vessel will be north of the red buoy with globe, abreast the southern part of the Karanja Reefs; thence the eastern turning mark will be Butcher Island tree in line with Trombay ruin until Middle Ground bears *N.W. by W. $\frac{1}{2}$ W.*

Generally vessels are moored on the inner side of the Middle Ground Shoal, and from there up to abreast Cross Island; but, when the harbour is crowded, some vessels moor further out, in the stream of that shoal, as the raising of it above the level of high water to form the battery has caused the tide streams in its vicinity to run with greater velocity. It would not be advisable for a stranger to pass within Middle Ground Shoal to the shipping in the night, but to anchor before Sunk Rock Light bears *S.W. by W.*, or, if necessary farther out, between Sunk Rock Shoal and the entrance of the harbour, where the sea is broken by the reefs. The Port Rules forbid any vessel, if above 200 tons, to enter, leave, or be moved in the port, without having a Pilot, Harbour Master, or Assistant to the Port Officer or Harbour Master on board.

The channel between Middle Ground Shoal and the north part of Karanja Shoal is about $1\frac{1}{2}$ miles broad.

Approaching from the northward do not shoal into less than 12 fathoms, until Prongs Lighthouse bears northward of east, when a course may be steered for the Outer Light, whence proceed as directed.

Inshore Channels—*South Channel.* Vessels proceeding through the South Channel should, after passing west of the buoy east of the North Patch, steer to pass the South Channel Beacon at a distance of a half to three-quarters of a cable, when a transit post, 20 feet high and surmounted by a ball, near the south corner of Mody Bandar, in line with a similar post, 39 feet high and surmounted by a triangle, near the north corner of the bandar, will lead along the east side of the channel in 9 to 12 feet water.

The ball should be kept a little east of the triangle as there are two 3-feet patches very close to the east of the line of the leading marks.

North Channel. The transit post near the north corner of Mody Bandar (which forms the back transit mark for the South Channel) is the front mark for the North Channel, and kept in line with a third transit pole, 39 feet high and surmounted by a drum, further at the back, leads through in 7 feet of water and clear of the North Channel Beacon. All transit marks and posts are painted red.

Fixed red lights are exhibited by night on the posts over the marks from 1st of September to 31st of May in each year.

The light on the triangle mark is in every case the highest light. The light at the ball mark will be screened from view in the North Channel, and that at the drum mark from view in the South Channel.

Prince's Dock Channel. The dredging operations in this channel alter both the depth and shape of it, by bringing the scour from the passage west of Butcher Island across the north-east and south-west extremes of the bank. The leading mark for the centre of the channel is a disc on the small flagstaff on the north side of the north entrance to the dock, in line with a double disc in the back-ground bearing *W. $\frac{3}{4}$ N.*

The beacon on the north end of Cross Island spit is about 100 feet south of the Prince's Dock Channel, the limits of which are defined by two cones on poles on the north side, and two drums on poles on the south side.

Lights. When the dock gates are open a light is exhibited from the tower on the island at the entrance of the Prince's Dock, with a *red* ray over the south side of the channel and a *white* ray over the centre. At the same time another light is exhibited from the tower on the north side of the entrance, with a *green*

ray over the north side, and a *white* ray over the centre of the channel.

Victoria Dock Channel. The leading marks when eastward of the North Channel Beacon are the same as for the Prince's Dock; after which the leading mark is a disc on the north side of the entrance to the dock in line with the lattice work signal staff of Victoria Dock.

Lights. When the dock gates are open a *red* light is exhibited in the place of the above disc, and *two red* lights *vertical* from the signal staff.

Malet Shelf. A rocky patch 4 feet above low-water springs, situated close to the foreshore about 3 cables north of the Prince's Dock entrance, has a beacon on it, surmounted by an iron drum, and is 28½ feet above low water springs.

The principal exports are, wheat, seeds, cotton, opium, cloves, coffee, dates, gum, ginger, horns, ivory, wood, pepper, twist and yarn, etc.

The imports are principally rice, gunny bags, coal, iron, wines, machinery, dry goods, tea, petroleum, glassware, sugar, timber, bricks and tiles, etc.

The value of both exports and imports is estimated at 17,000 lakhs of Rupees.

Without reckoning the native craft, the vessels that enter the port amount in an average year to over 2,000,000 tons.

There are sufficient boats for the requirements of the port, and most of the large shipping companies have their own fleet of cargo boats and steam launches.

Boatmen and labourers are always available in any quantity.

The cost of working cargo is about 5 Annas a ton. Coal 4 Annas a ton.

For machinery special arrangements must be made.

Landing and shipping general cargo from the stream costs from 12 Annas to 1 Rupee 8 Annas according to the season. Coal about 1 Rupee per ton.

Charges.

| | | Rs. | As. | P. |
|--|--------------------|-----|-----|----|
| Port dues, available for 30 days | per registered ton | 0 | 1 | 0 |
| Dock dues | per ton per day | 0 | 0 | 1 |
| Fresh water | per ton | 1 | 0 | 0 |

| | | Rs. | As. | P. |
|---------------------------------|----------------------------|-----|-----|----|
| Dock cranes (30 cwt.) | per day . | 5 | 0 | 0 |
| Wharfage charges vary. | | | | |
| On cotton goods | a bale | 0 | 4 | 0 |
| Iron | per ton, from Rs. 1-2-0 to | 1 | 10 | 0 |
| Grain | per ton | 0 | 8 | 0 |
| Oil seeds | „ | 0 | 10 | 0 |
| Other seeds | „ | 1 | 12 | 0 |
| Cotton (pressed) | per bale | 0 | 2 | 0 |

Kerosene oil and coal must be discharged into lighters in the stream; but kerosene oil in bulk may be discharged at the pier built for that purpose.

Pilotage is compulsory for all vessels over 100 tons. The service consists of 15 pilots under the orders of the Port Officer.

For pilotage fees the south-west monsoon is from 1st June to 30th September.

Pilotage is as follows.

| | Steamers. | | Sailing Ships. | |
|--|-----------|------|----------------|------|
| | Monsoons | | Monsoons | |
| | N.E. | S.W. | N.E. | S.W. |
| | Rs. | Rs. | Rs. | Rs. |
| Minimum 100 to 300 registered tons | 25 | 37 | 41 | 62 |
| Maximum 2,100 to 2,200 registered tons | 72 | 84 | 120 | 140 |

And an increase of 4 Rupees and 2 Annas on every 100 tons or part of 100 tons on sailing ships, and 2 Rupees and 8 Annas on every 100 tons or portion of 100 tons on steamers above this tonnage during the fair season.

In the south-west monsoon there is an additional extra rate on steamers of 12½ Rupees, and on sailing vessels of 20 Rupees.

Transporting Fees on Ships.

| | |
|---|--------|
| For 1,500 tons and upwards | Rs. 30 |
| From 1,500 tons to 1,000 tons | „ 25 |
| Under 1,000 tons | „ 20 |

Transporting Fees for Steamers using their own Engines.

| | |
|--|--------|
| From one berth to another south of Cross Island, or to or from any of the docks, or to any berth north of Cross Island, or <i>vice versa</i> | Rs. 20 |
| Transporting north of Cross Island | „ 15 |
| Vessels towed to or from any dock north of Cross Island; to or from or to fixed moorings | „ 15 |

A pilotage fee shall be held to cover the services of a pilot for all duties connected with the movement and anchorage of a vessel for a period of 12 hours from the time of joining the vessel, if his services are required so long.

If a pilot, after having been applied for, goes on board and the vessel is not ready, a fee of 20 Rupees will be charged for attendance.

When a pilot is appointed to transport a vessel into dock, and she does not enter the dock the same day, a second fee will be charged, and so on, if the delay is not caused by the fault of the pilot.

For steamers of under 1,000 registered tons, whose Masters have obtained a pilot's license for the outer harbour, half pilotage fees will be charged when the Masters pilot their own vessels to or from Sunk Rock Lighthouse.

Special pilotage for taking a vessel to Hog Island, Butcher's Island, or Nocar Point at single pilotage rates.

For vessels on trial trip, single pilotage fee. Vessels with gunpowder, if not moored in the harbour the day they arrive, must pay an attendance fee of 20 Rupees.

Towage Rates.

| | Rs |
|--|-----|
| From Sunk Rock Lighthouse to any dock for 1,000 ton vessel | 125 |
| Vessels over 1,000 tons | 150 |
| From Docks to Light-ship, 1,000 tons or under | 175 |
| Vessels over 1,000 tons | 225 |

The same rates apply to steamers when towed.

Brokerage, General Rates of Commission on Shipping Business are as follows.

| | Per cent. |
|--|-----------|
| 1. On procuring freight | 2½ |
| 2. On collecting freight | 2½ |
| 3. On tendering a vessel (if accepted), for the conveyance of troops; on the amount of the charter party | 2½ |
| 4. On shipping goods on which no commission for the purchase has been collected | 1 |
| 5. On shipping treasure, bullion, or jewelry | ½ |
| 6. On ship's disbursement | 1 |
| 7. On account of passage money | 5 |
| 8. For executing orders to charter or engage tonnage | 2½ |
| 9. On realizing Bottomry Bonds or negotiating a Respondentia Loan | 1 |
| 10. On moneys expended and on all disbursements made in efforts to save a ship or cargo | 2½ |
| 11. On sale of goods from wrecked vessel from ¼ to | 1 |

Scale of Fees under the Indian Steam Ships' Acts VII. of 1884, for survey of Steam Vessels.

| | |
|---|-----|
| RULE 13. —For steamships of which the tonnage— | Rs. |
| Does not exceed 25 tons | 40 |

| | | | | Rs. |
|--|---|-------|-------|-----|
| Exceeds 25 tons but does not exceed 50 tons . . . | | | | 50 |
| „ 50 | „ | 75 | „ . . | 60 |
| „ 75 | „ | 100 | „ . . | 70 |
| „ 100 | „ | 300 | „ . . | 80 |
| „ 300 | „ | 600 | „ . . | 90 |
| „ 600 | „ | 900 | „ . . | 100 |
| „ 900 | „ | 1,200 | „ . . | 120 |
| „ 1,200 | „ | 1,500 | „ . . | 145 |
| and for every additional 300 tons or fraction of 300 tons above 1,500 tons | | | | 25 |

These rates are for certificates which, if not in the meantime cancelled or suspended, will remain in force for one year from the date thereof.

If the ship's hull, machinery or equipments are stated in the certificate to be sufficient only for a period of less than one year from the date thereof, one twelfth of the above annual amount shall be payable for each month or fraction of a month comprised in the said period, provided that :—

(a) The minimum fee shall be one-fourth of the annual fee ;

(b) In the case of a new steam ship coming under survey for the first time, the full annual fee shall be payable, whatever be the nature of the certificate.

RULE 14.—The fee payable under Rule 13 shall be deemed to cover three visits of a Surveyor.

An additional fee at the rate of 8 Annas for every 20 tons, or fraction of 20 tons of the ship's tonnage, but not in any case exceeding 10 Rupees, shall be payable for every extra visit that a surveyor makes, with the approval of the Port Officer, before he is able to grant this declaration.

In addition to the above, a fee of 50 Rupees in respect of every survey required on a Sunday, New Year's Day, Good Friday, King's Birthday, and Christmas Day, is payable at the time of application to the Port Officer, half the fee to be credited to the S. V. Survey Fund and the other half to be paid to the Surveyor.

Scale of Fees under Act VI. (the Inland Steam Vessels' Act) of 1884, for survey of Inland Steam Vessel.

| RULE 11. —For steamships for which the gross tonnage— | | | | Rs. |
|--|---|-------|-----------|-----|
| Is 100 and under | | | | 40 |
| Over 100 tons and not exceeding 300 tons | | | | 60 |
| „ 300 | „ | 900 | „ | 80 |
| „ 900 | „ | 1,200 | „ | 100 |
| „ 1,200 | „ | 1,500 | „ | 120 |
| „ 1,500 | „ | 1,800 | „ | 140 |
| „ 1,800 | „ | 2,100 | „ | 160 |
| For every additional 300 tons | | | | 20 |

RULE 12.—On Sundays and Government holidays, 20 Rupees per hour will be charged in addition to the fees ordinarily chargeable. Time spent in travelling is not to be included in the charge allowed for holidays.

Bombay Port Rules.

1. Pilots may take steamers to sea from clear berths, or bring them into harbour on ordinary nights, when the lights are visible and reasonable distant objects discernible, but they shall on no account run unnecessary risks by venturing within the leading marks, or keeping vessels under weigh when the lights cannot be seen.

2. Vessels arriving without a pilot shall anchor to the eastward of the Sunk Rock Light.

3. Vessels under weigh in the south-west monsoon shall have both bower anchors and cables clear and ready for use if required.

4. All vessels within the Port of Bombay shall be bound to take up such berths as may be appointed for them by the Harbour Master, and shall change their berths and remove when required by that authority.

5. All vessels whilst moored within the Port of Bombay shall have their jib-booms rigged in, and shall when ordered by the Port Officer, or any of his assistants, rig in their driver-booms, and strike their masts or yards. Signals made from flagstaff on the north-east bastion of the Castle directing the striking of masts or yards or the rigging in of booms, shall be obeyed as orders.

6. Anchors shall not be allowed to remain cock-billed, nor spare spars be allowed to hang alongside or astern of any vessels.

7. Vessels taking in or discharging ballast, or any kind of cargo, within the Port of Bombay, shall be bound to take up such berths as the Port Officer may direct.

8. Vessels when not working cargo during the night shall have any open hatchways protected by stout nettings.

9. Free passages shall be kept to all piers, jetties, landing places, wharves, docks, and moorings, and all boats and vessels shall be bound to move when required to clear such passages.

10. A clear space of at least 30 yards wide is to be preserved in front of all landing places.

11. Boats, whether ship's boats or boats plying for hire, shall not lay alongside any of the piers or landing places longer than is actually necessary to embark or land passengers and their baggage, etc., but will anchor or lay off at a distance of at least 30 yards from such pier or landing place, so as not to obstruct the approach thereto.

12. No vessels of or exceeding 100 feet in length shall attempt to turn in the inshore channel, as herein defined, except by means of warps or springs attached to the piers; the usual method of turning these vessels, when requiring to do so on approaching or leaving the piers, shall be by proceeding out through the channel and turning either to the north or south clear of the channel.

13. No vessel of the above description shall attempt to turn in the said inshore channel between the points aforesaid when the water is at a lower level than half tide.

14. The inshore channel before referred to comprises that area of water bounded as follows:—

On the north by a line drawn from the north extreme of Carnac Bandar sea wall, to the extreme north point of Cross Island. On the south by a line drawn from the Tower or St. Xavier's College to the north side of the Pilgrims. Dharmshala and continued to the east limit. On the east by a line drawn from the Malet Shelf Beacon through the Beacon on the north-west extreme

of Cross Island reefs and continued to the south limit. On the west by a line drawn along the sea walls of the Carnac and Mody Bandars and continued to the south limit.

15. It shall be the duty of all other vessels to keep out of the way of sea-going vessels in charge of pilots when passing through the wet dock channels, and every such sea-going steamer, or tug towing a sea-going vessel in charge of a pilot, when so passing through the wet dock channels, shall sound the steam whistle at short intervals as a warning to other vessels to get out of the way.

16. A large red signal ball by day, and two red lights one above the other by night, shall be exhibited at the Victoria or Prince's Dock flagstuffs when the dock gates are open, as a warning to other vessels to keep clear of sea-going vessels navigating the wet dock channels.

17. For the purposes of these rules the wet dock channels are defined as follows:—

“Bounded on the north by a line drawn through two transit poles surmounted by cones fixed on the east and west side of the Prince's Dock and continued to the eastward.

“On the east by the east side of Cross Island in transit with the Dolphin Lighthouse.

“On the south by a line drawn from the centre of the gable at the north-east corner of No. 13 shed, the round venetian window in the middle of which is painted white, to North Channel Beacon, thence on a line with the North Channel Beacon in transit with lighthouse tower on the Island.

“On the west from the steps about 600 feet south of Victoria Dock entrance to the north transit line, or about 450 feet north of the Island between the Prince's Dock gates.”

18. All vessels within the Port of Bombay shall moor and unmoor or anchor in accordance with the orders of the Port Officer or of the Harbour Master.

19. No vessel shall anchor within that portion of the Port of Bombay comprehended as follows:—On the north by a line drawn from the extreme northern point of Kundari (Kennerly) Island to the patch of isolated rocks situated near and the north-eastward thereof, and thence to the south brow of Kunkeshvar Hill. On the east by the line of coast extending along the foreshore from a point due west of the south brow of Kunkeshvar Hill to the boundary mark erected on the beach close to the fishing village of Navagam at the mouth of a creek about 2 miles to the south of the south brow of Kunkeshvar Hill. On the south by a line drawn westward from the boundary mark above referred to through the southern extreme of Undari Island to the beacon to the eastward of Kundari (Kennerly) Island and thence to the south extreme of the latter, and on the west by the eastern shore line of Kundari (Kennerly) Island.

20. Between the 1st of June and 30th September vessels shall be moored with 60 fathoms of cable on the flood, and 45 fathoms on the ebb anchor, and between the 1st of October and the 31st of May with 45 fathoms on the flood and 45 fathoms on the ebb, and shall keep a clear hawse.

21. Vessels when moored or at anchor, shall have ranges of both cable on deck ready to be veered immediately on receiving orders to do so.

22. Vessels at single anchor shall also have a second anchor ready to be let go.

23. All vessels within the Port of Bombay shall be moved or warped from place to place as required, and by such means or appliances as may be ordered by the Port Officer or Harbour Master.

24. No vessel shall cast off a warp that has been made fast to her to assist a vessel mooring, without being required to do so by the pilot, or officer in charge of the vessel mooring.

25. Commanders of steam vessels when about to enter or leave the Prince's Dock shall keep a sufficient pressure of steam to move their engines ahead or astern at full power, as may be required, until such time as their ships are berthed in the dock, or are clear of the channel and shall be responsible for such pressure being so maintained.

26. No private vessel shall use any of the Government fixed moorings without permission.

27. More than two tiers of two in each tier, of cargo boats, full or empty, shall not be permitted to hang astern of any vessel without permission of the Port Officer.

28. The Master or any other person in charge of any vessel when at anchor or moored in the harbour, shall not allow such a number of cargo boats to be made fast to the vessel, either alongside or astern, as shall cause the vessel to drag its anchor or moorings.

29. Rafts of timber made fast to vessels shall not be allowed to extend more than one hundred feet from the stern, or more than fifty from the side of the vessel.

30. Rafts of timber shall not be warped, floated, or moved in any way across the Prince's or Victoria Dock Channels at any time when the red ball is hoisted at the Dock Signal Flagstaff by day, or when the two red lights are hoisted at the signal staff at night.

31. Boats, whilst under weigh, shall observe the rules of the road at sea enacted by Her Majesty's Order in Council, dated 1st July, 1897.

32. When two boats, one being propelled by sails and the other by oars, are proceeding on a course which, if continued, will involve risk of collision, the boat propelled by oars shall keep out of the way of the other, but the boat under sail shall use every precaution to avoid accident, and if necessary, shall alter its course.

33. Tugs, when not towing launches and other boats propelled by steam, shall keep out of the way of all other boats.

34. Tugs, launches and other vessels, steam and sailing, shall carry the regulation lights, as ordered by Her Majesty's Order in Council, dated 1st July, 1897.

35. Launches and other boats propelled by steam shall be steered from forward of the centre of the vessel, and the helmsman shall be so placed as to have a clear view around and to some distance from the vessel.

36. Licensed boats shall on all occasions, when it may be practicable, give way to private boats or to boats belonging to vessels of war.

36a. Every dredger when at work laying out chains or not under control, and every Hopper when similarly employed in attendance on any such Dredger and not under control, shall carry by day as a signal three shapes as follows :—

(1) The three shapes shall be arranged in a vertical line, one above the other, and be hoisted where they can best be seen by other vessels.

(2) The uppermost and the lowest of the three shapes shall be—

(a) Globular in shape and red in colour.

(b) Not less than two feet in diameter.

(3) The second shape shall be—

(a) Six feet below the uppermost shape, and six feet above the lowest shape.

(b) Diamond in shape, and white in colour.

(c) Not less than two feet in diagonal.

36b. All vessels and boats shall give every Dredger and Hooper carrying a signal, required by rule 36a. a wide berth, in such a manner as taking into consideration that such Hopper or Dredger is out of control and cannot get out of the way, may be necessary to avoid all interference with it and with its operations.

37. Boats lying within 50 yards of the dockyard stairs or wharfs, or within 50 yards of the wharf in the basin formed within the breakwater in the vicinity of the Custom-House Bander, or of any of the dry or wet docks in the port, shall not have any fire on board.

38. Pitch shall not be heated on board vessels but in a boat alongside or astern.

39. Vessels whilst loading cotton shall not have any unprotected lights in the hold or orlop.

40. All spirits, oil, paints and spirits of turpentine or other inflammable substances on board the vessels, shall be stored in a place of security.

41. Vessels requiring to be steamed or fumigated shall be moored below the Middle Ground clear of the shipping.

42. All vessels of whatever rig or denomination when under weigh or at anchor shall exhibit the lights ordered under Her Majesty's Order in Council, dated July 1st, 1897, and when moored in the harbour, shall exhibit, where it can best be seen, but at a height not exceeding 20 feet above the hull, a bright white light in a globular lantern not less than 8 inches in diameter and so constructed as to show a clear, uniform and unbroken light, visible all round the horizon at a distance of at least one mile.

43. All vessels when afloat within the port shall have on board a sufficient number of crew to perform any duties which may become necessary for the safety of the vessel in regard to veering or heaving in cable, bracing up the yards, striking masts and the yards, etc., in case an emergency arising.

44. The steps at the east face of this pier shall be the ordinary landing place for launches, cutters, gigs, or other vessels propelled by steam power, to go alongside for the purpose of landing or embarking passengers or for any other purpose.

It is prohibited for the above vessels to use the slope or inside steps on the north side of the pier or the slope on the south side, except between the 15th May and 15th September each year.

Penalty for infringement of this Bye-law, 50 Rupees (fifty).

45. No whistle or syren shall be used by any person on a steam launch within 200 yards of the landing place, except when necessary for the purpose of giving warning to the other vessels of the proximity or approach of the steam launch.

Quarantine Rules.

I.—The Master of every vessel in or entering the port on board of which there is or has been during the voyage from which she is arriving or has last arrived either among the passengers or crew any case of cholera, small-pox or other epidemic disease common in India, or of measles or scarlatina, or if two or more deaths from unknown or suspicious causes have occurred on the voyage, shall report such case or cases at the earliest possible moment to the Health Officer of the port, unless it shall appear that notice has already been received by that officer through the Pilot or by signal or otherwise as provided for by Rule II.

II.—If the vessel is coming into port, the Master shall report such case or cases to the Pilot or other boarding officer at the earliest opportunity, or if she be not boarded or is already at anchor within Port limits, shall hoist a signal which shall be during the

day the flag *R.* of the Commercial Code at the main and during the night three lights, viz. :—red, white and red one above the other at the same place, and shall also verbally by an officer or in writing inform the officer in charge of the Police Hulk. If the vessel be in Dock, the report shall be made at the Dock Master's Office.

It shall be the duty of the Pilot or other officer to whom any such report is made to communicate the same directly to the Health Officer of the Port. The Port Officer or officer in charge of the Police Hulk in any case of which he has received information from a Pilot or other officer, or by signal, and the officer in charge at the Dock Master's Office in any case reported there, shall forthwith communicate the information to the Health Officer of the Port and shall inform the Master of his having done so.

Pending the arrival of the Health Officer the Master should act as laid down in Rules V. and VI.

III.—The Health Officer, as early as possible after receipt of any report of the nature contemplated in Rules I. and II., shall inspect the vessel, more especially with reference to its sanitary condition; shall enquire into the circumstances attending the case or cases of the said disease; and shall with the assistance of the Police and Municipal authorities arrange for the conveyance of all persons suffering from such disease to a hospital, unless the sick person or his friends can make adequate provision elsewhere, and for the separation and disinfection or destruction of any infected bedding, clothes or cargo.

IV.—Provided that no onward bound passengers shall be removed from the vessel and no cargo or property shall be destroyed, otherwise than with the consent of the Master of the vessel or of the owner, except under the clearest necessity—and of every such case a special report explaining the reasons for the action taken must be submitted to Government.

V.—No vessel coming under Rule I. shall enter Dock without the permission of the Health Officer of the port. But where the disease or diseases in question are limited to one or two cases, she shall not be prohibited from proceeding to or remaining at the usual place of anchorage in the harbour, nor as a rule need the passengers or crew be detained on board pending the inspection of the Health Officer. But the Master of the vessel shall be held responsible that all suitable precautions are taken to prevent the spread of the disease, and that no passenger suspected of having such disease is allowed to depart, and no bedding, cargo, or other article which has been tainted by the discharges of or by contact with persons suffering from such disease is landed before the inspection.

VI.—Where cases have been more numerous than one or two, or when from their occurring on Pilgrim or Emigrant ships or for other special reasons further precautions may be deemed advisable, the vessel shall proceed or be moved as soon as possible to the anchorage appointed for the purpose, and none of the passengers or crew shall be allowed to leave, nor in the case of undecked vessels shall any cargo be disturbed until the Health Officer has made his inspection, and has taken such measures as he considers necessary.

VII.—Vessels coming under the last rule shall remain at the appointed anchorage and shall fly the flag *Q* by day at the main, and by night exhibit two red lights one above the other at the main till they have been thoroughly cleansed and fumigated, all other precautions considered necessary by the Health Officer have been taken, and permission has been given by him for them to proceed on their voyage or to the usual place of anchorage. Provided that all of the passengers and crew, who on inspection by the Health Officer are found healthy may be allowed to leave at once under such precautions as he may consider necessary, the Health Officer of the Municipality being warned of the action taken.

In the case of small-pox it shall be the duty of the Health Officer of the port to cause to be vaccinated all those on board who appear to require this protection and who are willing to accept it.

VIII.—No person dying of any infectious disease of the nature contemplated in these or in the Quarantine Rules shall be buried by sea burial within 10 miles of the port. Persons dying of such disease in port shall be burnt, or where burning is impossible, buried on shore. Bodies may be given to the relations or friends of the deceased for disposal, the Health Officer of the Port and Municipality and the Police being informed. The latter shall take steps to see that the burning or burying is carried out without undue delay and that proper precautions are taken against the spread of the disease.

In the absence of friends or relations, the expense of disposing of the corpse must be borne by the Master or owner of the vessel who will be held responsible that the requirements of this rule are attended to. In the case of infectious diseases in an epidemic form occurring among the Shipping and Native Craft, they will be removed to the appointed anchorage under arrangements to be made by the Port Officer, and the corpses either buried or burned on shore under special arrangements to be made by the Water Police.

IX.—All Officers of Customs, Port Trust, Water and Dock Police, the Executive Health Officer of the Municipality and the Resident Surgeons of Public Hospitals should immediately communicate to the Health Officer of the Port information of any case of infectious disease among the shipping on the foreshore, or in places frequented by seamen that may come to their notice.

Storm Warning Signals.

The following Storm Warning Signals will be displayed at the undermentioned places in this port, viz. :—

The Castle Flagstaff (by day and night).

The Victoria Dock Entrance Flagstaff (by day only).

Cautionary Signal.

The square flag W of the International Code will be hoisted on the Storm Signal Staff as a cautionary signal. It indicates the existence of disturbed weather off some part of the West Coast of India in the neighbourhood of the port or ports at which the signal is hoisted; or the advance of a cyclonic storm across the peninsula from the Bay of Bengal which may hence shortly cross the Western Ghats and give squally or stormy weather in the Arabian Sea. The disturbed conditions may in either case pass away without giving stormy cyclonic weather to the West Coast ports or adjacent ports of the Arabian Sea, in which case the cautionary signal will be taken down as soon as it is certain that stormy weather will not shortly follow. If, however, this disturbed weather be the first indication of the probable formation or approach of a cyclonic storm, this cautionary signal will be followed by one of the ordinary storm signals indicating the probable position, character and track of the approaching storm.

Signal No. 1.

Or warning signal consists of a canvas shape representing a drum, and when hoisted signifies that a storm is in existence in the Arabian Sea, which may either approach the

port, or which may shortly cross one or the other of the usual tracks of vessels leaving the port.

There is no night signal corresponding to this day signal.

Signal No. 2.

A black cone apex down by day, and three red lights apex down by night.

This signifies that a cyclonic storm is likely to affect the port and give it strong winds at first from the southwards. The shift of wind will depend on the tract of the storm (*i.e.* whether from east or west, etc.).

Signal No. 3.

A black cone apex up by day, and three red lights apex up by night.

This signal signifies that a cyclonic storm is likely to affect the port and give it winds at first from northwards. The shift of wind will depend upon the track of the storm (*i.e.*, whether from east to west, etc.).

Signal No. 4.

A black drum over a black cone by day, and four red lights in the form of a square by night.

This signal signifies that a heavy cyclone is approaching the port, and that the centre will probably pass over or very near to the port; and hence that the shift of wind is likely to be rapid and the strength of the wind to be very great.

The signals will be hoisted on receipt of instructions from the Simla Meteorological Office, and will be finally lowered on receipt of instructions from the Simla Office when the storm has broken up or is no longer likely to give bad weather at this port.

Copies of all Weather Telegrams received from Simla will be posted at the Port Office, and also at the Dock Master's Office, Prince's Dock.

Ship Masters wishing for more precise information should consult these telegrams.

In accordance with Act V., of 1883, the Master of any vessel which has been lost, stranded or materially damaged, or on which any casualty has happened resulting in loss of life, or has caused damage to any other vessel, should report the same to the Port Officer, Bombay, failing which he is liable to a penalty of 500 Rupees, or three months' imprisonment.

Special Port Signals hoisted at the Colaba Signal Station, and repeated at the Castle Flagstaff.

Yard-arm Signals.

Flags.

Flag--Diagonal white with blue cross and blue ball in centre.

Meaning.

A steamer in sight, to be hoisted at the north or south yard-arm according to her bearing; hoisted in conjunction with a distinguishing flag, it denotes the company to which the vessel belongs.

| <i>Flags.</i> | <i>Meaning.</i> |
|----------------------------|---|
| Flag—Red pendant | A sail in sight, to be hoisted at the north or south yard-arm according to the bearing of the sail when first seen. |
| „ C pendant | Two sails are in sight in one direction. |
| „ D „ | Three sails are in sight in one direction. |
| „ G „ | Four sails are in sight in one direction. |

Flagstaff Signals.

| | |
|--|--|
| Union Jack | H.E. the Viceroy, or the Governor of a Presidency or Colony, is entering the port. |
| White ensign | A British man-of-war is entering the port. |
| Steamer's flag and white ensign under | One of H.M.'s Indian troop-ships is entering the port. |
| Red ensign | Guns are being fired at Kennerly Island. |
| Blue flag | A large country craft is in distress or on shore. |
| Red, white and blue flag (horizontal stripes). | Recall for His Majesty's or Indian or Colonial Government vessels hoisted over their number. |
| Union Jack with white ensign under . | Vessels of war entering the port; carries an Admiral's flag or Commodore's pennant. |
| Blue ensign | A vessel of the Indian or of a Colonial Government is entering the port. |
| Red and white horizontal stripes . . | A foreign vessel of war is entering the port. |
| Red ensign Jack down | A vessel is in distress, or on shore. |
| Pilot Jack | Pilot schooner is absent from her station. |
| White, blue and white flag (horizontal stripes). | Recall for merchant vessels hoisted over their number. |
| Q Flags | Quarantine. |
| R „ | |
| Red pendant with three white crosses . | Europe Mail. |
| White, red, yellow, blue pendant (vertical stripes). | China Mail. |
| Blue, white, red, yellow pendant (horizontal stripes). | Australian Mail. |
| K Flag | Karrachi Mail. |

Flags not repeated at Castle Flagstaff.

| <i>Flags.</i> | <i>Meaning.</i> |
|-----------------------------|--|
| Pendant | To pilot schooner that "Færie" is going out. |
| Pilot Jack over C | Recalls "Sphinx." |
| „ D | „ "Flirt." |
| „ F | „ "Færie." |
| „ G | „ "Gig." |

Signals to Colaba Signal Station.

English Mail.

By day.

Red pennant with three white crosses
or Royal Mail pendant.

By night.

Three white lights (vertical) at foreyard.

China Mail.

A white, red, yellow, blue pendant
(vertical stripes).

Two red lights (vertical), six feet apart at
foreyard.

Australian Mail.

A blue, white, red, yellow pendant
(horizontal stripes).

Karrachi Mail.

K Flag.

Quarantine.

Q or R Flag at foremast head . . . Two white lights at foremast head. To
sound whistle.

His Majesty's Indian Troopships.

Two white lights at foremast head.

Royal Navy or Indian Marine Vessel.

Two white lights at mizzen-peak.

Hired Transport Vessels.

Two white lights at mizzenmast head.

Bombay.

Ships.—The standard ton of Bombay for ships for measurement of goods is at 50 cubic feet. The freight of oil is paid on the full gauge of the cask, ascertained at the port of discharge, and when freight is payable on weight, the same is on the net-weight delivered.

Steamers.—The above scale and the accompanying rules regulate the steamer-trade from Bombay and the Malabar Coast to the United Kingdom and the Continental Ports in Europe, in the absence of special agreement to the contrary:—

1. The Tonnage Scales for steamers are on the basis of 40 cubic feet, and 18 cwt. dead-weight to the ton.
2. Hides and skins, whether in bales or bundles, are taken by measurement, and not by weight.
3. Oil is taken on the outside measurement of the cask.
4. When freight is payable on weight, it is on the net-weight delivered.

Ships and Steamers.—The conversion into Indian currency of sterling freight payable in Bombay, is made at the rate for Bank Bills on London (payable on demand, unless otherwise stipulated); and the rate ruling at the close of the mail is the rate applicable to such purpose during the subsequent week.

Madras and Coromandel Coast.

Coir in Bales, Cotton, Ganjah, Hemp, Jute, Munjeet,
Senna Leaf, Wool, Sarsaparilla.

Ships and Steamers.—The articles mentioned above are measured, before shipment, at the Press, Godown, or on the Beach, at the option of the shipper, and the measurement is entered on the face of the Bill of Lading. In measuring the Callipers take in the rope, or iron hoop on the one side of the bale, and leave it out on the other. Half inches are given and taken alternately. Ten bales per cent. as a maximum are measured, moiety to be chosen by the shipper, and moiety by the ship; and, in the event of any dispute arising, the bales are measured by a surveyor to be appointed by the Chamber of Commerce. The surveyor's decision is final, and his fee of five Rupees is borne equally by each party. All other goods are measured at port of discharge.

When freight is payable on weight, it is on the net weight delivered.

Note.—Gingelly Seed, Ground Nut Kernels, Castor Seed, etc., from the Madras Coast are taken at the above scale; but, if for a continental or Mediterranean port, it is usual to stipulate for 20 cwts. to the ton.

Calcutta.

Ships and Steamers.—Goods in casks and cases are calculated at gross weight when paying freight by weight. Where freight is payable on measurement, the measurement is taken by sworn measurers under the direction of the Bengal Chamber of Commerce, the charge for measurement being defrayed by the ship. This rule applies for the most part to baled cargo. Cargo in cases is usually measured at the port of discharge.

The term "dead-weight" is understood to mean the following articles only:—Sugar, Rice, Saltpetre, Wheat, Grain, Peas, Dholl, and all metals.

Tonnage Schedule for Ships and Steamers at Ports in British India

ARRANGED BY THE DIFFERENT CHAMBERS OF COMMERCE.

| ARTICLES. | | | | | | | | | | BOMBAY, KARACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | | | | | | | | |
|--------------------------------|--|--|--|--|--|--|--|--|--|---------------------------------|-----|---------------------|-----|------------------------------------|-----|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|
| | | | | | | | | | | Ship. | | Steamer. | | Ship or Steamer. | | Ship or Steamer. | | Ship. | | Steamer. | | | | |
| | | | | | | | | | | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. |
| Aloes, in bags or boxes | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | | |
| " in kegs | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | | |
| Alum, in bags | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | | |
| Annatto, in cases | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | | |
| Aniseed, in bags | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | | |
| Apparel, in boxes | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| Arrack | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| Arrowroot, in bags | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| " in cases | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| Arsenic, in bags or cases | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Assafoetida, in cases and bags | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Bajri, in bags | | | | | | | | | | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

| ARTICLES. | BOMBAY, KARRACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|--|----------------------------------|-----|---------------------|-----|------------------------------------|-----|---------------------|-----|
| | Ship. | | Steamer. | | Ship or Steamer. | | Ship. | |
| | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. |
| Barilla | 20 | 0 | 16 | 0 | 20 | 0 | | |
| Bark, in bags | — | — | — | — | 20 | 0 | | |
| Barley, in bags | — | — | 15 | 0 | 8 | 0 | | |
| Bees' Wax, in bags | — | — | — | — | — | — | | |
| " in cases | — | — | — | — | 20 | 0 | | |
| Betelnut, in bags | 0 | 50 | 0 | 40 | 20 | 0 | | |
| Blackwood, in straight square logs | 16 | 0 | 13 | 0 | 20 | 0 | | |
| " otherwise | 0 | 50 | 0 | 40 | 20 | 0 | 16 | 0 |
| Bones, loose | 20 | 0 | 16 | 0 | — | — | | |
| Bone Meal or Bone Dust | 20 | 0 | 20 | 0 | — | — | | |
| Books | 0 | 50 | 0 | 40 | 0 | 50 | | |
| Borax or Tineal, in bags | 20 | 0 | 16 | 0 | 20 | 0 | | |
| " in cases | 0 | 50 | 0 | 40 | — | 0 | 50 | |
| Bran | — | — | — | — | 14 | 0 | — | |
| Brimstone | — | — | — | — | 20 | 0 | 20 | 0 |
| Bullion | per cent. | | per cent. | | per cent. | | per cent. | |
| Cake Lac, in bags | — | — | — | — | 16 | 0 | 16 | 0 |
| Camphor, in cases | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 |

ARTICLES.

| | BOMBAY, KARACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|--|---------------------------------|-----|---------------------|-----|------------------------------------|-----|---------------------|----------|
| | Ship. | | Steamer. | | Ship or Steamer. | | Ship. | |
| | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. |
| Canes, Rattans, in bundles | 16 | 0 | 13 | 0 | — | — | 12 | 0 |
| Cardamoms, in bags | — | — | — | — | — | — | 0 | — |
| " in boxes | — | — | — | — | 10 | 0 | 0 | 50 |
| " in bundles | 0 | 50 | — | — | 0 | 50 | — | — |
| " in robins | — | — | — | — | — | — | — | — |
| Cassia Lignea, Fistula and Buds | 0 | 50 | 0 | 40 | 8 | 0 | 0 | 50 |
| Cassia, all sorts, in bags | — | — | — | — | 0 | 50 | — | — |
| " in bales | — | — | — | — | 12 | 0 | — | — |
| Castor Seed | 17 | 0 | 14 | 0 | 15 | 0 | 0 | 50 |
| Chassum | 10 | 0 | 8 | 0 | 15 | 0 | — | — |
| Chillies, in bags | — | — | — | — | — | — | 12 | 0 |
| " in robins | — | — | — | — | 14 | 0 | — | — |
| China Root, in bags | — | — | — | — | 11 | 0 | 11 | 0 |
| " in cases | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 |
| Chiretta | — | — | — | — | 0 | 50 | 0 | 50 |
| Churrah | — | — | — | — | 14 | 0 | — | — |
| Cigars | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 |
| Cinchona Bark and Chips, in bags | — | — | — | — | — | — | 800 lbs. | 800 lbs. |

ARTICLES.

| ARTICLES. | | | | BOMBAY, KARACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | | |
|---------------------------------------|---------------------|-----|---------------------|---------------------------------|---------------------|-----------|---------------------|------------------------------------|---------------------|-------------|---------------------|-----|
| | Steamer. | | Ship. | | Ship or Steamer. | | Ship or Steamer. | | Ship. | | Steamer. | |
| | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. |
| Cinchona Bark, in bales | . | . | — | — | — | — | 0 | 50 | 0 | 50 | 0 | 50 |
| Cinnamon, in bales | . | . | 6 | 0 | — | — | — | — | 800 lbs. | 1200 lbs. | 0 | 50 |
| " in cases | . | . | 0 | 50 | 0 | 40 | — | — | 0 | 50 | 0 | 50 |
| " in bags | . | . | — | — | — | — | — | — | 800 lbs. | 800 lbs. | 0 | 50 |
| Cloves, in bags or frazils | . | . | 10 | 0 | 8 | 0 | 8 | 0 | — | — | — | — |
| " in cases | . | . | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 | — | — |
| Coals | . | . | 20 | 0 | — | — | 20 | 0 | 20 | 0 | — | — |
| Cochineal, in cases | . | . | — | — | — | — | 0 | 50 | 0 | 50 | — | — |
| Cocoa, in bags or casks | . | . | 12 | 0 | 10 | 0 | — | — | 12 net del. | 14 net del. | 14 | 0 |
| " in cases | . | . | — | — | — | — | — | — | 0 | 50 | 0 | 50 |
| Cocoa Nut Oil, in casks | . | . | — | — | — | — | — | — | 17 nt. ship | 14 | 0 | 0 |
| Cocculus Indicus, in bags | . | . | 16 | 0 | 13 | 0 | — | — | — | — | — | — |
| " in robins | . | . | — | — | — | — | — | — | — | — | — | — |
| Coffee, in bags or frazils | . | . | 16 | 0 | 12 | 0 | 18 | 0 | 18 | 0 | 16 | 0 |
| " in cases | . | . | 0 | 50 | 0 | 40 | — | — | 17 | 0 | — | — |
| " in casks and robins | . | . | — | — | — | — | 16 | 0 | 16 | 0 | 14 | 0 |
| Coir, in bales | . | . | 0 | 50 | 0 | 40 | — | — | 0 | 50 | 0 | 50 |
| " in bundles or loose ballots, dholls | . | . | 6 | 0 | 5 | 0 | 12 | 0 | — | — | 12 | 0 |

| ARTICLES. | BOMBAY, KARACHI, AND KARWAR. | | | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|---|---------------------------------|-----|---------------------|-----|-------------------------------|-----|------------------------------------|-----|---------------------|-----|
| | Ship. | | Steamer. | | Ship or Steamer. | | Ship or Steamer. | | Ship. | |
| | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. |
| Coir Rope, in coils | 8 | 0 | 0 | 40 | — | — | — | — | 12 | 0 |
| „ Yarn and Fibre, screwed bales | — | — | — | — | — | — | 0 | 50 | 0 | 0 |
| „ „ in bundles, ballots | — | — | — | — | — | — | 10 | 0 | 12 | 0 |
| Coir Junk, in pieces | — | — | — | — | — | — | — | — | — | — |
| Colocynth, in cases | 0 | 50 | 0 | 40 | — | — | — | — | — | — |
| Colombo Root, in bags | 14 | 0 | 8 | 0 | — | — | — | — | — | — |
| Copra, in robins | 12 | 0 | 8 | 0 | 14 | 0 | — | — | — | — |
| „ in bags, cut in two pieces | 12 | 0 | — | — | — | — | — | — | 10 | 0 |
| „ in bulk | — | — | — | — | — | — | — | — | 12 | 0 |
| „ in bales | — | — | — | — | — | — | — | — | 0 | 50 |
| „ in bales | — | — | — | — | — | — | — | — | — | — |
| „ in bales | 20 | 0 | 16 | 0 | 20 | 0 | — | — | — | — |
| „ in bales | — | — | — | — | 12 | 0 | 12 | 0 | — | — |
| „ in bales | 0 | 50 | 0 | 40 | 5 bales not exceed. 52 ft. | — | — | — | 0 | 50 |
| „ in bales | — | — | — | — | — | — | 0 | 50 | — | — |
| „ in piecegoods | — | — | — | — | — | — | 0 | 50 | — | — |
| „ Seed, in bags | 13 | 0 | — | — | — | — | — | — | — | — |
| „ Cowries, in bags | 20 | 0 | 16 | 0 | 20 | 0 | 20 | 0 | — | — |
| „ in cases | 0 | 50 | 0 | 40 | — | — | — | — | — | — |

ARTICLES.

| | BOMBAY, KARRACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|---------------------------------------|----------------------------------|-----|---------------------|-----|------------------------------------|-----|---------------------|-----|
| | Ship. | | Steamer. | | Ship or Steamer. | | Ship. | |
| | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. |
| Galingals | 12 | 0 | 10 | 0 | — | — | — | — |
| Galls, in bags | 16 | 0 | 13 | 0 | — | — | — | — |
| " in cases | 0 | 50 | 0 | 40 | — | — | — | — |
| Garlic and Onions | — | — | — | — | 12 | 0 | 12 | 0 |
| Ghee, in lubbers or casks | — | — | — | — | — | — | — | — |
| Gingelly Seed | 17 | 0 | 15 | 0 | 20 | 0 | 17 | 0 |
| Ginger, dry, in bags | 12 | 0 | 10 | 0 | 16 | 0 | 12 | 0 |
| " in cases | 0 | 50 | 0 | 40 | — | — | 0 | 50 |
| Gram, in bags | 20 | 0 | 17 | 0 | 20 | 0 | 20 | 0 |
| Ground Nuts, in shell | 8 | 0 | 6 | 0 | — | — | 12 | 0 |
| " shelled | 16 | 0 | 13 | 0 | — | — | 16 | 0 |
| Gums of all kinds, in cases | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 |
| " Olibanum, in bags | 16 | 0 | 13 | 0 | — | — | — | — |
| Gunjah | — | — | — | — | 0 | 50 | 0 | 50 |
| Gunny Bags | — | — | — | — | 50 ft. not over } | | 0 | 50 |
| " Cloth | — | — | — | — | 2240 lbs. } | | 0 | 50 |
| Hartall, in cases | 0 | 50 | 0 | 40 | — | — | — | — |
| Hemp, in screwed bales | 0 | 50 | 0 | 40 | 5 bales, not ex. 52 feet | | 0 | 50 |

ARTICLES.

| | BOMBAY, KARACHI, AND KARWAR. | | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|---|---------------------------------|-----------------------|----------------------|---------------------|--------------------|------------------------------------|---------------------|--------------------|-------------------|
| | Ship. | Steamer. | Ship or Steamer. | To the ton. cwt. | To the ton. ft. | Ship or Steamer. | To the ton. cwt. | To the ton. ft. | Ship. Steamer. |
| Hemp, loose or in bundles | To the ton. cwt. 7 | To the ton. cwt. 5 | To the ton. ft. 0 | — | — | — | — | — | — |
| Hides, unpressed | — | — | — | — | — | — | — | — | — |
| Hides and Skins, in screwed bales | — | 0 | 40 | — | — | — | — | — | — |
| " " loose and in small bundles | 12 | 0 | 40 | — | — | — | — | — | — |
| " Buffalo or Cow, cured | — | — | — | 14 | 0 | — | — | — | — |
| Hoots, Horn shavings and tips | 16 | 13 | 0 | 20 | 0 | 20 | 0 | 0 | — |
| Horns, Buffalo or Cow, loose | 16 | 13 | 0 | 20 | 0 | 20 | 0 | 16 | 0 |
| " " in bundles | 8 | 6 | 0 | — | — | — | — | — | — |
| " Deer, loose | 8 | 6 | 0 | 20 | 0 | 16 | 0 | — | — |
| India-Rubber, in bags | — | — | — | 16 | 0 | — | — | — | — |
| " " in cases | — | — | — | 0 | 50 | — | — | — | — |
| Indigo, in cases | 0 | 0 | 40 | 0 | 50 | 0 | 50 | — | — |
| Iron | — | — | — | 20 | 0 | — | — | — | — |
| Jackwood | 0 | 0 | 40 | — | — | — | — | — | — |
| Jowarree (Dari) | 20 | 18 | 0 | — | — | — | — | — | — |
| Jute | — | — | — | 5 bales not | ex. 52 feet | 0 | 50 | — | — |
| " Cuttings | — | — | — | 5 bales not | ex. 52 feet | 0 | 50 | — | — |

ARTICLES.

| | BOMBAY, KARRACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|--|----------------------------------|-----|---------------------|-----|------------------------------------|-----|---------------------|-----|
| | Ship. | | Steamer. | | Ship or Steamer. | | Ship. | |
| | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. |
| Lac Dye, in cases | 0 | 50 | 0 | 40 | 0 | 50 | | |
| Lang, in bags | 20 | 0 | 18 | 0 | | | | |
| " crushed | | | 17 | 0 | | | | |
| Lard | | | | | | | | |
| Linseed, in bags | 18 | 0 | 16 | 0 | 0 | 50 | | |
| Mace, in cases | 0 | 50 | 0 | 40 | 0 | 50 | | |
| Machinery | | | | | 20 | 0 | | |
| Maize | | | 16 | 0 | | | | |
| Mathie Seed | | | | | 18 | 0 | | |
| Measurement Goods | | | | | | | | |
| Metals | | | | | 20 | 0 | 0 | 50 |
| Molasses | | | | | 2 Punchs. or 4 Hhds. | | | |
| Mother-o'-Pearl, in bags | 20 | 0 | 16 | 0 | 20 | 0 | | |
| " in cases | 0 | 50 | 0 | 40 | 20 | 0 | | |
| Mowra Flowers | 20 | 0 | 18 | 0 | | | | |
| " Seed | 16 | 0 | 13 | 0 | | | | |
| Munjeet or Madder Root, in bundles or bags | 12 | 0 | 8 | 0 | | | | |

ARTICLES.

| ARTICLES. | BOMBAY, KARACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|---|---------------------------------|-------------------------|-------------------------|-------------------------|------------------------------------|-------------------------|-------------------------|--|
| | Ship. | Steamer. | Ship or Steamer. | Ship or Steamer. | Ship or Steamer. | Ship. | Steamer. | |
| | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | |
| Munjeet or Modder Root, in cases or bales . | 50 | 0 | 40 | 0 | 50 | | | |
| Musk, in cases . | 0 | 50 | 0 | 40 | — | | | |
| Mussor, in bags . | 20 | 0 | 20 | 0 | — | | | |
| Mustard Seed, in bags . | 17 | 0 | 16 | 0 | 20 | 18 | 0 | |
| Myrobalans, in bags . | 16 | 0 | 13 | 0 | 16 | 17 | 0 | |
| Niger Seed . | 17 | 0 | 14 | 0 | 20 | 17 | 0 | |
| Nutmegs, in cases or casks . | 0 | 50 | 0 | 40 | 0 | 50 | 0 | |
| Nux Vomica, in bags . | 16 | 0 | 13 | 0 | 16 | 16 | 0 | |
| " in cases . | 50 | 0 | 0 | 40 | — | 16 | 0 | |
| Oats . | — | — | — | 16 | 0 | 12 | 0 | |
| Oil, of any kind, in casks . | 210 imp. gals. | 0 | 40 | 4 Hhds. | 210 im. gals. | | | |
| " in cases . | — | — | — | 0 | 50 | 20 | 0 | |
| Olibanum . | — | — | — | — | 18 | 0 | | |
| Opium . | per chest | per chest | per chest | per chest | — | — | | |
| Orchella Weed, in bags or bundles . | — | — | — | — | — | 12 | 0 | |
| Paddy, in bags . | 16 | 0 | 13 | 0 | 16 | 15 | 0 | |
| Palmatine, in bags . | — | — | — | 16 | 0 | — | — | |
| Peas . | — | — | — | 20 | 0 | 20 | 0 | |

ARTICLES.

| | BOMBAY, KARRACHI, AND KARWAR. | | | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|---|----------------------------------|----------|---------------------|---------------------|---------------------|---------------------|------------------------------------|-------|---------------------|----------|
| | Ship. | Steamer. | | Ship or Steamer. | | Ship or Steamer. | | Ship. | | Steamer. |
| | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. | To the ton. cwt. | ft. |
| Pepper, in bags | 16 | 0 | 13 | 0 | — | — | 16 | 0 | — | — |
| " long | — | — | — | — | 12 | 0 | — | — | — | — |
| " black | — | — | — | — | 14 | 0 | — | — | — | — |
| Pimento, in bags | 14 | 0 | 12 | 0 | — | — | — | — | — | — |
| Planks and Deals, see Timber | — | — | — | — | 0 | 50 | 0 | 50 | — | — |
| Plumbago, in bags or barrels | 20 | 0 | 16 | 0 | — | — | — | — | 20 | 0 |
| Poonac or Oil-cake, in casks, barrels or bags | — | — | — | — | — | — | — | — | 17 | 0 |
| Poppy Seed | — | — | — | — | 20 | 0 | 15 | 0 | — | — |
| " in bags, 1½ cwt. | 17 | 0 | 14 | 0 | — | — | — | — | — | — |
| " in double bags, 1½ cwt. | 16 | 0 | 13 | 0 | — | — | — | — | — | — |
| " in single bags, 1½ " | 17 | 0 | 14 | 0 | — | — | — | — | — | — |
| " in double bags, 1½ " | 17 | 0 | 14 | 0 | — | — | — | — | — | — |
| Putehuck | — | — | — | — | 10 | 0 | 10 | 0 | — | — |
| Rags | — | — | — | — | 0 | 50 | — | — | — | — |
| Rape Seed, in bags | — | — | 16 | 0 | 20 | 0 | 18 | 0 | — | — |
| Rantans, in bundles | 16 | 0 | 13 | 0 | — | — | 20 | 0 | — | — |
| " ground | 16 | 0 | 13 | 0 | — | — | — | — | — | — |
| " for dunnage | — | — | — | — | 20 | 0 | — | — | — | — |

| ARTICLES. | BOMBAY, KARRACHI, AND KARWAR. | | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | | | | |
|---|----------------------------------|---------------------|-----|---------------------|----------------------------|------------------------------------|---------------------|---------------------|-----|-------|---------------------|-----|
| | Ship. | Steamer. | | Ship or Steamer. | To the ton. cwt. | ft. | Ship or Steamer. | To the ton. cwt. | ft. | Ship. | To the ton. cwt. | ft. |
| | | To the ton. cwt. | ft. | | | | | | | | | |
| Raw Silk, in bales | — | — | — | — | 10 | 0 | — | — | — | — | — | — |
| Red Wood, for dunnage | 16 | 0 | 13 | 0 | 20 | 0 | 20 | 0 | 20 | 0 | — | — |
| Rhea, in bales | — | — | — | — | 5 bales not ex. 52 feet | 0 | 50 | — | — | — | — | — |
| Rhubarb, in cases | 0 | 50 | 0 | 40 | — | — | — | — | — | — | — | — |
| Rice, in bags | 20 | 0 | 13 | 0 | 20 | 0 | 20 | 0 | 20 | 0 | — | — |
| Roping, in coils | — | — | — | — | 0 | 50 | 0 | 50 | — | — | — | — |
| " Lines, and Twines, in bundles | — | — | — | — | 16 | 0 | 14 | 0 | — | — | — | — |
| " Coir in coils | — | — | — | — | — | — | 10 | 0 | — | — | — | — |
| Run, in casks | — | — | — | — | 2 punches, or 4 Hoghds. | 210 imp. gls. | — | — | — | — | — | — |
| Safflower, in bags | 10 | 0 | 8 | 0 | — | — | — | — | — | — | — | — |
| " in screwed bales | 0 | 50 | 0 | 40 | 5 bales not ex. 52 feet | 0 | 50 | — | — | — | — | — |
| " in cases | 0 | 50 | 0 | 40 | — | — | — | — | — | — | — | — |
| Sago, in cases | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 | — | — | — | — |
| Sal Ammoniac, in bags | 13 | 0 | 15 | 0 | 20 | 0 | 15 | 0 | 15 | 0 | — | — |
| " in boxes | 0 | 50 | 0 | 40 | 20 gross | 0 | 50 | — | — | — | — | — |

| ARTICLES. | BOMBAY, KARRACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|----------------------------------|----------------------------------|--------------------|---------------------|--------------------|------------------------------------|--------------------|---------------------|--------------------|
| | Ship. | | Steamer. | | Ship or Steamer. | | Ship. | |
| | To the ton. cwt. | To the ton. ft. | To the ton. cwt. | To the ton. ft. | To the ton. cwt. | To the ton. ft. | To the ton. cwt. | To the ton. ft. |
| Salt | 28 In. Mds. | 28 In. Mds. | 28 In. Mds. | 28 In. Mds. | 28 In. Mds. | 28 In. Mds. | 28 In. Mds. | 28 In. Mds. |
| Saltpetre, in bags | 20 | 0 | 16 | 0 | 20 | 0 | 20 | 0 |
| Sandal and Sapan Wood | 16 | 0 | 11 | 0 | 20 | 0 | 20 | 0 |
| Sarsaparilla | — | — | — | — | — | — | — | — |
| Sealing Wax, in cases | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 |
| Seed Lac, in cases | — | — | — | — | — | — | — | — |
| " in bags | — | — | — | — | 16 | 0 | 16 | 0 |
| Senna, in bags | 6 | 0 | 5 | 0 | — | — | — | — |
| " in bales | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 |
| Sharks' Fins | — | — | — | — | 16 | 0 | 16 | 0 |
| Shells, rough, in bags | 20 | 0 | 16 | 0 | 20 | 0 | 20 | 0 |
| Shellac, in bags | — | — | — | — | 16 | 0 | 16 | 0 |
| " in cases | — | — | — | — | 0 | 50 | 0 | 50 |
| Silk, in bales | 10 | 0 | 8 | 0 | — | — | — | — |
| " in cases | 0 | 50 | 0 | 40 | — | — | — | — |
| " Chussum | — | — | — | — | 0 | 50 | 0 | 50 |
| " Waste | — | — | — | — | 0 | 50 | 0 | 50 |

| ARTICLES. | BOMBAY, KARACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL COAST. | | CEYLON. | |
|---|---------------------------------|--------------------|---------------------|--------------------|------------------------------------|--------------------|---------------------|--------------------|
| | Ship. | | Steamer. | | Ship or Steamer. | | Ship. | |
| | To the ton. cwt. | To the ton. ft. | To the ton. cwt. | To the ton. ft. | To the ton. cwt. | To the ton. ft. | To the ton. cwt. | To the ton. ft. |
| Silk Piecegoods | — | — | — | — | — | — | — | — |
| Skins | — | — | — | — | — | — | — | — |
| Soap country, in cases | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 |
| " in bags | — | — | — | — | 15 | 0 | 15 | 0 |
| " in bars | — | — | — | — | 20 | 0 | 20 | 0 |
| Stick Lac, in cases | — | — | — | — | 0 | 50 | 0 | 50 |
| " in bags | — | — | — | — | 16 | 0 | 16 | 0 |
| Sugar, in bags | 20 | 0 | 16 | 0 | 20 | 0 | 20 | 0 |
| Talc | 20 | 0 | 16 | 0 | 20 | 0 | 20 | 0 |
| Tallow, in cases or casks | 0 | 50 | 0 | 40 | 20 | 0 | 20 | 0 |
| Tamarinds, in cases or casks | 18 | 0 | 15 | 0 | 20 | 0 | 20 | 0 |
| Tapioca | — | — | — | — | 0 | 50 | 0 | 50 |
| Tea, in chests | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 |
| Teel Seed (Gingelly Seed) | — | — | 15 | 0 | 20 | 0 | — | — |
| Timber, squares, planks, and poon | 0 | 05 | 0 | 40 | 0 | 50 | 0 | 50 |
| " round | one-fifth off | one-fifth off | one-fifth off | one-fifth off | 0 | 40 | — | — |
| Tobacco, in bales | 0 | 50 | 0 | 40 | 5 bales not exceed. 52 ft. | — | 0 | 50 |

ARTICLES.

| ARTICLES. | BOMBAY, KARACHI, AND KARWAR. | | CALCUTTA. | | MADRAS AND COROMANDEL Coast. | | CEYLON. | |
|---|---------------------------------|-------------------------|-------------------------|-------------------------|------------------------------------|-------------------------|-------------------------|-------------------------|
| | Ship. | Steamer. | Ship or Steamer. | Ship or Steamer. | Ship or Steamer. | Ship. | Steamer. | |
| | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. | To the ton. cwt. ft. |
| Tortoise Shells, in chests | 0 | 50 | 0 | 40 | 0 | 50 | | |
| Tutenague | 20 | 0 | 16 | 0 | — | — | | |
| Turneric, in bags | 13 | 0 | 11 | 0 | 16 | 0 | 14 | 0 |
| Unrated Wood | 14 | 0 | 11 | 0 | — | — | | |
| Weed Seed, in bags | — | — | 10 | 0 | — | — | | |
| Whangees (<i>vide</i> Canes) | 16 | 0 | 13 | 0 | — | — | | |
| Wheat, in bags | 20 | 0 | 18 | 0 | 20 | 0 | 20 | — |
| Wine and Spirits, in casks | 0 | 50 | 0 | 40 | — | — | | |
| Wine, in cases | 0 | 50 | 0 | 40 | — | — | | |
| Wool, in screwed bales | 0 | 50 | 0 | 40 | 0 | 50 | 0 | 50 |
| Zadoary | 20 | 0 | 16 | 0 | — | — | | |
| All other articles not enumerated in bales or cases | 0 | 50 | 0 | 40 | 0 | 50 | — | 0 |

Revised Regulations for Preventing Collisions at Sea.

In force from 1st July, 1897.

Schedule I.

Preliminary.

These rules shall be followed by all vessels upon the high seas and in all waters connected therewith, navigable by sea-going vessels.

In the following rules every steam vessel which is under sail and not under steam is to be considered a sailing vessel, and every vessel under steam, whether under sail or not, is to be considered a steam vessel.

The word "steam vessel" shall include any vessel propelled by machinery.

A vessel is "under way" within the meaning of these rules when she is not at anchor, or made fast to the shore or ground.

Rules concerning Lights, etc.

The word "visible" in these rules, when applied to lights, shall mean visible on a dark night with clear atmosphere.

ART. 1. The Rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

ART. 2. A steam vessel when under way shall carry—

- (A) On or in front of the foremast, or, if a vessel without a foremast, then in the fore part of the vessel, at a height above the hull of not less than 20 feet, and if the breadth of the vessel exceeds 20 feet then at a height above the hull not less than such breadth, so, however, that the light need not be carried at greater height above the hull than 40 feet, a bright white light, so constructed as to show an unbroken light over an arc of the horizon of 20 points of the compass, so fixed as to throw the light 10 points on each side of the vessel, *viz.*, from right ahead to 2 points abaft the beam on either side, and of such a character as to be visible at a distance of at least 5 miles.
- (B) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of 10 points of the compass, so fixed as to throw the light from right ahead to 2 points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least 2 miles.
- (C) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of 10 points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible at a distance of at least 2 miles.
- (D) The said green and red side-lights shall be fitted with inboard screens projecting at least 3 feet forward from the light, so as to prevent these lights from being seen across the bow.

- (E) A steam vessel when under way may carry an additional white light similar in construction to the light mentioned in sub-division (A). These two lights shall be so placed in line with the keel that one shall be at least 15 feet higher than the other, and in such a position with reference to each other that the lower light shall be forward of the upper one. The vertical distance between these lights shall be less than the horizontal distance.

ART. 3. A steam vessel when towing another vessel shall, in addition to her side-lights, carry two bright white lights in a vertical line one over the other, not less than 6 feet apart, and when towing more than one vessel shall carry an additional bright white light 6 feet above or below such lights, if the length of the tow, measuring from the stern of the towing vessel to the stern of the last vessel towed exceeds 600 feet. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in Article 2 (A), except the additional light, which may be carried at a height of not less than 14 feet above the hull.

Such steam vessel may carry a small white light abaft the funnel or aftermast for the vessel towed to steer by, but such a light shall not be visible forward of the beam.

ART. 4. (A) A vessel which from any accident is not under command shall carry at the same height as the white light mentioned in Article 2 (A), where they can best be seen, and, if a steam vessel, in lieu of that light two red lights in a vertical line, one over the other, not less than 6 feet apart, and of such a character as to be visible all round the horizon at a distance of at least 2 miles; and shall by day carry in a vertical line, one over the other, not less than 6 feet apart, where they can best be seen, two black balls or shapes each 2 feet in diameter.

(B) A vessel employed in laying or in picking up a telegraph cable shall carry in the same position as the white light mentioned in Article 2 (A), and, if a steam vessel, in lieu of that light three lights in a vertical line, one over the other, not less than 6 feet apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all round the horizon, at a distance of at least 2 miles. By day she shall carry in a vertical line, one over the other, not less than 6 feet apart, where they can best be seen, three shapes, not less than 2 feet in diameter, of which the highest and lowest shall be globular in shape and red in colour, and the middle one diamond in shape and white.

(C) The vessels referred to in this Article when not making way through the water shall not carry the side-lights, but when making way shall carry them.

(D) The lights and shapes required to be shown by this Article are to be taken by other vessels as signal that the vessel showing them is not under command, and cannot, therefore, get out of the way.

These signals are not signals of vessels in distress and requiring assistance. Such signals are contained in Article 31.

ART. 5. A sailing vessel under way, and any vessel being towed, shall carry the same lights as are prescribed by Article 2 for a steam vessel under way, with the exception of the white lights mentioned therein which they shall never carry.

ART. 6. Whenever, as in case of small vessels under way during bad weather, the green and red side-lights cannot be fixed, these lights shall be kept at hand lighted and ready for use; and shall, on the approach of or to other vessels, be exhibited on their

respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side, nor the red light on the starboard side, nor, if practicable, more than 2 points abaft the beam on their respective sides.

To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the colour of the light they respectively contain, and shall be provided with proper screens.

ART. 7. Steam vessels of less than 40, and vessels under oars or sails of less than 20 tons gross tonnage, respectively, and rowing boats, when under way, shall not be obliged to carry the lights mentioned in Article 2 (A), (B), and (C), but if they do not carry them they shall be provided with the following lights:—

1. Steam vessels of less than 40 tons shall carry—
 - (A) In the fore part of the vessel, or on or in front of the funnel, where it can be seen, and at a height above the gunwale of not less than 9 feet, a bright white light constructed and fixed as prescribed in Article 2 (A), and of such a character as to be visible at a distance of at least 2 miles.
 - (B) Green and red side-lights constructed and fixed as prescribed in Article 2 (B) and (C), and of such a character as to be visible at a distance of at least 1 mile, or a combined lantern showing a green light and a red light from right ahead to 2 points abaft the beam on their respective sides. Such lantern shall be carried not less than 3 feet below the white light.
2. Small steam boats, such as are carried by sea-going vessels, may carry the white light at a less height than 9 feet above the gunwale, but it shall be carried above the combined lantern mentioned in sub-division 1 (B).
3. Vessels under oars or sails, of less than 20 tons, shall have ready at hand a lantern with a green glass on one side and a red glass on the other, which, on the approach of or to other vessels, shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.
4. Rowing boats, whether under oars or sail, shall have ready at hand a lantern showing a white light, which shall be temporarily exhibited in sufficient time to prevent collision.

The vessels referred to in this Article shall not be obliged to carry the lights prescribed by Article 4 (A) and Article 11, last paragraph.

ART. 8. Pilot vessels, when engaged on their station on pilotage duty, shall not show the lights required for other vessels, but shall carry a white light at the masthead, visible all round the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed 15 minutes.

On the near approach of or to other vessels they shall have their side-lights lighted ready for use, and shall flash or show them at short intervals, to indicate the direction in which they are heading, but the green light shall not be shown on the port side, nor the red light on the starboard side.

A pilot vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board, may show the white light instead of carrying it at the masthead, and may, instead of the coloured lights above mentioned, have at hand ready for use a lantern with a green glass on the one side and a red glass on the other, to be used as prescribed above.

Pilot vessels, when not engaged on their station on pilotage duty, shall carry lights similar to those of other vessels of their tonnage.

ART. 9.*

ART. 10. A vessel which is being overtaken by another shall show from her stern to such last-mentioned vessel a white light or a flare-up light.

The white light required to be shown by this Article may be fixed and carried in a lantern, but in such case the lantern shall be so constructed, fitted, and screened that it shall throw an unbroken light over an arc of the horizon of 12 points of the compass, viz., for six points from right aft on each side of the vessel, so as to be visible at a distance of at least one mile. Such light shall be carried as nearly as practicable on the same level as the side lights.

ART. 11. A vessel under 150 feet in length, when at anchor, shall carry forward, where it can best be seen, but at a height not exceeding 20 feet above the hull, a white light in a lantern so constructed as to show a clear, uniform, and unbroken light, visible all round the horizon at a distance of at least one mile.

A vessel of 150 feet or upwards in length, when at anchor shall carry in the forward part of the vessel at a height of not less than 20, and not exceeding 40 feet above the hull, one such light, and at or near the stern of the vessel, and at such a height that it shall not be less than 15 feet lower than the forward light, another such light.

The length of a vessel shall be deemed to be the length appearing in her certificate of registry.

A vessel aground in or near a fairway shall carry the above light or lights and the two red lights prescribed by Article 4 (A).

ART. 12. Every vessel may, if necessary in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that cannot be mistaken for a distress signal.

ART. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to any additional station and signal lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorised by their respective Governments and duly registered and published.

ART. 14. A steam vessel proceeding under sail only, but having her funnel up, shall carry in daytime, forward, where it can best be seen, one black ball or shape about 2 feet in diameter.

Sound-Signals for Fog, etc.

ART. 15. All signals prescribed by this Article for vessels under way shall be given:—

1. By "steam vessels" on the whistle or siren.
2. By "sailing vessels and vessels towed" on the fog-horn.

The words "prolonged blast" used in this Article, shall mean a blast of from four to six seconds' duration.

A steam vessel shall be provided with an efficient whistle or siren, sounded by steam or some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog-horn, to be sounded by mechanical means, and also with an efficient bell.† A sailing vessel of 20 tons gross tonnage or upwards shall be provided with a similar fog-horn and bell.

* This Article will deal with regulations affecting fishing boats and will be the subject of another Order, which will be submitted to His Majesty for approval at a later date.

† In all cases where the Rules require a bell to be used, a drum may be substituted on board Turkish vessels, or a gong where such articles are used on board small sea-going vessels.

In fog, mist, falling snow, or heavy rain storms, whether by day or by night, the signals described in this Article shall be used as follows, viz. :—

- (A) A steam vessel having way upon her, shall sound, at intervals of not more than two minutes, a prolonged blast.
- (B) A steam vessel under way, but stopped and having no way upon her, shall sound, at intervals of not more than two minutes, two prolonged blasts, with an interval of about one second between them.
- (C) A sailing-vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession.
- (D) A vessel, when at anchor, shall at intervals of not more than 1 minute, ring the bell rapidly for about 5 seconds.
- (E) A vessel, when towing a vessel employed in laying or in picking up a telegraph cable, and a vessel under way, which is unable to get out of the way of an approaching vessel through being not under command, or unable to manœuvre as required by these rules, shall, instead of the signals prescribed in sub-divisions (A) and (C) of this Article, at intervals of not more than 2 minutes, sound three blasts in succession, viz., one prolonged blast followed by two short blasts. A vessel towed may give this signal, and she shall not give any other.

Sailings-vessels and boats of less than 20 tons gross tonnage shall not be obliged to give the above-mentioned signals, but if they do not, they shall make some other efficient sound-signal at intervals of not more than 1 minute.

Speed of Ships to be Moderate in Fog, etc.

ART. 16. Every vessel shall, in a fog, mist, falling-snow, or heavy rain-storm, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam vessel hearing, apparently forward of her beam, the fog signal of a vessel the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

Steering and Sailing Rules.

Preliminary—Risk of Collision.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

ART. 17. When two sailing vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other, as follows, viz. :—

- (A) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.
- (B) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled on the starboard tack.
- (C) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.
- (D) When both are running free, with the wind on the same side, the vessel which is to windward shall keep out of the way of the vessel which is to leeward.

(E) A vessel which has the wind aft shall keep out of the way of the other vessel.

ART. 18. When two steam vessels are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two vessels which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are when each of the two vessels is end on, or nearly end on to the other; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own; and, by night, to cases in which each vessel is in such a position as to see both the side-lights of the other.

It does not apply, by day, to cases in which a vessel sees another ahead crossing her own course; or by night, to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

ART. 19. When two steam vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

ART. 20. When a steam vessel and a sailing vessel are proceeding in such directions, as to involve risk of collision, the steam vessel shall keep out of the way of the sailing vessel.

ART. 21. Where by any of these rules one or two vessels is to keep out of the way, the other shall keep her course and speed.

Note.—When, in consequence of thick weather or other causes, such vessels find herself so close that collision cannot be avoided by the action of the giving-way vessel alone, she also shall take such action as will best aid to avert collision. (*See Articles 27 and 29.*)

ART. 22. Every vessel which is directed by these rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

ART. 23. Every steam vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

ART. 24. Notwithstanding anything contained in these rules, every vessel, overtaking any other, shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, *i.e.*, in such a position, with reference to the vessel which she is overtaking, that at night she would be unable to see either of that vessel's side-lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel cannot always know with certainty whether she is forward of or abaft this direction from the other vessel, she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

ART. 25. In narrow channels every steam vessel shall, when it is safe and practicable, keep to that side of the fairway or mid channel which lies on the starboard side of such vessel.

ART. 26. Sailing vessels under way shall keep out of the way of sailing vessels or boats fishing with nets or lines or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fairway used by vessels other than fishing vessels or boats.

ART. 27. In obeying and constructing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

Sound-Signals for Vessels in sight of one another.

ART. 28. The words "short blast" used in this Article shall mean a blast of about one second's duration.

When vessels are in sight of one another, a steam vessel under way, in taking any course authorised or required by these rules, shall indicate that course by the following signals on her whistle or siren, viz. :—

One short blast to mean, "I am directing my course to starboard."

Two short blasts to mean, "I am directing my course to port."

Three short blasts to mean, "My engines are going full speed astern."

No Vessel under any circumstances to neglect proper Precautions.

ART. 29. Nothing in these rules shall exonerate any vessel, or the owner, or master, or crew thereof, from the consequence of any neglect to carry lights or signals, or of any neglect to keep a proper look-out, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

Reservation of Rules for Harbours and Inland Navigation.

ART. 30. Nothing in these rules shall interfere with the operation of a special rule, duly made by local authority, relative to the navigation of any harbour, river, or inland waters.

Schedule II.

Distress Signal.

ART. 31. When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, viz. :—

In the daytime—

1. A gun or other explosive signal fired at intervals of about a minute;
2. The International Code signal of distress indicated by N.C.

3. The distant signal, consisting of a square flag, having either above or below it a ball or anything resembling a ball ;
4. A continuous sounding with any fog-signal apparatus.

At night—

1. A gun or other explosive signal fired at intervals of about a minute ;
2. Flames on the vessel (as from a burning tar-barrel, oil-barrel, etc.) ;
3. Rockets or shells, throwing stars of any colour or description, fired one at a time, at short intervals ;
4. A continuous sounding with any fog-signal apparatus.

Basses Light Dues.

Vessels arriving or departing from ports in the Presidency of Madras are liable to be charged with Basses Light Dues at 4 pias per ton under the following conditions :—

- “ Every ship which in the same voyage by the southward of Ceylon shall cross a line drawn from the southernmost point of Ceylon to the northwesternmost point of the Island of Sumatra, and also a line from the southernmost point of Ceylon to Cape Guardafui, on the eastern coast of Africa, and *vice versa*.”
- “ Every ship which, in any voyage to or from any place in the Maldivé Islands, shall cross a line drawn from the southernmost point of Ceylon to the northwesternmost point of Sumatra.”
- “ Every ship which in any voyage from any port on the eastern coast of Africa, south of Cape Guardafui, or from any port in Madagascar, Bourbon, Mauritius, or any island adjacent to the same, including the Seychelles and the Chagos Islands, or in any voyage in which such ship shall have rounded the Cape of Good Hope eastward, shall cross a line drawn from the southernmost point of Ceylon to the southernmost point of the coast of Tenasserim, and shall, between the first day of April and the thirtieth day of September, both included, arrive at any port situated north of such line.”
- “ Every ship which, having departed between the first day of October and the thirty-first day of March, both included, from any port situated to the northward of such last-mentioned line, and also to the westward of the ninetyeth meridian of longitude east from Greenwich, in any voyage to any port on the eastern coast of Africa south of Cape Guardafui, or to any port in Madagascar, Bourbon, Mauritius, or any island adjacent thereto, including the Seychelles and the Chagos Islands, or in any voyage in which such ship shall round the Cape of Good Hope westward, shall cross the latitude of the Great Basses Lighthouse, or the Little Basses Lighthouse, will pass the said Great Basses Lighthouse and the said Little Basses Lighthouse, and will derive benefit therefrom.”

Vessels arriving in ballast are exempted from Basses Light Dues.

Minicoy Light Dues.

Vessels arriving or departing from ports in the Presidency of Madras are liable to be charged with Minicoy Light Dues at one pie per ton under the following condition:—

“ Every ship which in any voyage shall or may pass between the Laccadive Islands and the Maldive Islands through the channel known as the Nine Degree Channel, north of Minicoy Islands, or through that known as the Eight Degree Channel, south of Minicoy Island.”

“ For Great and Little Basses and Minicoy five pies per ton.”

Straits Light Dues.

Straits Light Dues are levied under the following rules.

1. If the voyage be one in the ordinary course whereof such vessels would pass the whole of the Straits Lights, at the rate of two cents. of a dollar or eight pies of a rupee for every ton of her burden.
2. If the voyage be one in the ordinary course of which she would pass any one or more of the Straits Lights, but not all of them, at the rate of one cent. of a dollar or four pies of a rupee for every ton of her burden.

The Use of Oil as a Sea-Smoother

Is strongly insisted upon, and no apology is necessary to our readers for making public the following quotation from the Pilot Chart, which is reprinted from the Abstract Storm Log issued by the United States Hydrographic Office, where space is provided for the record of experience in using oil, and opinions regarding it. Masters of vessels cannot be reminded too often of the use of oil in stormy weather. Its importance is well illustrated by the fact that it is recognised in standard books on Seamanship. The International Marine Conference at Washington recommended that "the several Governments require all their sea-going vessels to carry a sufficient quantity of animal or vegetable oil, for the purpose of calming the sea in rough weather, together with suitable means for applying it." Thick and heavy oils are the best. Mineral oils are not so effective as animal or vegetable oils. Raw petroleum has given favourable results, but is not so good when refined. Certain oils like cocoa-nut oil and some kinds of fish oil congeal in cold weather, and are therefore useless, but may be mixed with mineral oils to advantage. As a general rule, probably the best way to use oil is by filling the closet-bowls forward with oakum and oil, letting the oil drip out slowly through the waste-pipes. Another simple and easy way to distribute oil is by means of canvas bags about one foot long, filled with oakum and oil, pierced with holes by means of a coarse sail-needle, and held by a laniard. Running before a gale, use oil from bags at the cat-heads or from forward waste-pipes; if yawing badly and threatening to broach to, use oil forward and abaft the beam, on both sides. Lying to, distribute oil from the weather-bow. With a high beam sea, use oil-bags at regular intervals along the weather side. In a heavy cross sea, have bags along both sides. Steaming into a heavy head-sea, use oil through forward closet-pipes. There are many other cases where oil may be used to advantage, such as lowering and hoisting boats, riding to a sea-anchor, crossing rollers or surf on a bar, and from lifeboats and stranded vessels.

LIST OF ILLUSTRATIONS.

| | PAGES |
|---|-------|
| 1. Saugor Lighthouse | 23 |
| 2. Hugli Pilot Brig | 26 |
| 3. Madras from Seaward | 88 |
| 4. Old Seven Pagodas Lighthouse, or Mahabalipuram . . | 147 |
| 5. Pondicherry from Seaward | 149 |
| 6. Pamban Lighthouse from the Anchorage | 161 |
| 7. Mount Dilly | 249 |
| 8. Kaup Lighthouse | 255 |
| 9. Deria Bahadur Ghur, Malpe, South Canara | 257 |
| 10. Ameni Island, Laccadives | 267 |
| 11. Karwar from the Anchorage | 274 |
| 12. S.W. Prongs Lighthouse, Bombay | 302 |



INDEX.



| A | PAGES |
|--------------------------------------|-------|
| Adrampatam | 160 |
| Adunda Island | 218 |
| Aganis Peak | 189 |
| Agra Rock | 60 |
| Aguada Point and Light | 281 |
| Alibagh | 297 |
| Alleppey | 224 |
| do. Port Dues | 227 |
| do. Pier and Tramway Rates | 226 |
| Amblangoddi | 194 |
| Ambolgarh Reef and Point | 287 |
| Amsterdam Island | 185 |
| Anjediva Island | 274 |
| Anjenvai Light | 291 |
| Anjengo | 221 |
| Apollo Spit | 304 |
| Aripo River | 212 |
| Arneghon Light | 84 |
| Asses' Ears | 252 |

| B | PAGES |
|----------------------------|-------|
| Badagara | 242 |
| Baindur | 259 |
| Balasore | 50 |
| Bankote | 292 |
| Barbelyn Light | 194 |
| Barnacle Rock | 306 |
| Barn Hill | 252 |
| Baron's Cap | 188 |
| Barwa, or Baruva | 58 |
| Basses Lights | 190 |
| Bavanapadoo | 59 |
| Batticaloa | 188 |
| Bekal | 250 |
| Belikeri Point | 273 |
| Beliapatam | 248 |
| Bellikatna Rocks | 192 |
| Beyport | 236 |
| Berhampore | 57 |

| | PAGES |
|--|-------|
| Bhatkal | 269 |
| Bimlipatam | 64 |
| Boat Hire at Gopulpur | 62 |
| do. do. Ganjam | 63 |
| do. do. Sonapur, Barwah, Pundi, Bapaupadu, and Calingapatam | 63 |
| do. do. Bimlipatam | 69 |
| do. do. Vizagapatam | 70 |
| do. do. Pudimadaka and Pen- takota | 71 |
| do. do. Cocanada | 78 |
| do. do. Masulipatam | 86 |
| do. do. Kottapalem, Nizam- patam, Ipurupalem, and Motupalle | 86 |
| do. do. Kottapatam, Iskapalli, Itammukkala, and Ramavapatam | 87 |
| do. do. Madras | 123 |
| do. do. Cuddalore and Porto Novo | 152 |
| do. do. Negapatam, Nagore, Tirumalayavassal, Tran- quebar, Toppaturai, Mutupet, Adirampa- tam, and Valanguni | 158 |
| do. do. Pamban | 166 |
| Boat Hire Rates, Tuticorin | 172 |
| do. do. Colombo | 209 |
| do. do. Colachel and Quilon | 223 |
| do. do. Alleppey | 225 |
| do. do. Cochin | 232 |
| do. do. Calicut, Badagara, Tellicherry, Can- manore and Bey- port | 239 |
| do. do. Mangalore | 259 |
| do. do. Malpe, Kundapur, and Hangarakatta | 259 |
| Bombay | 299 |

| | PAGES | | PAGES |
|--------------------------------|-------|-----------------------------------|-------|
| Bombay Port Rules | 317 | Colombo Pilotage | 195 |
| do. Signals | 324 | do. Signals | 210 |
| do. Tonnage Scale | 313 | do. Light | 196 |
| do. Pilotage | 314 | Comorin, Cape | 217 |
| do. Charges | 313 | Condachi | 212 |
| do. Transporting Fees | 314 | Coromandel Coast, Tonnage Scale | 327 |
| do. Towage Rates | 315 | Covelong | 146 |
| do. Brokerage | 315 | do. Point | 220 |
| Boria Pagoda | 260 | Cowcolly Light | 22 |
| Buffalo Rock | 276 | Crocodile Rock | 218 |
| Buoyage, Uniform System of, in | | Cross Island | 304 |
| Indian waters | 9 | Cuddalore and Light | 150 |
| Burmana Point | 286 | Cyclones, Signals | 16 |
| Butcher Island | 305 | Cyclone Code for Madras and Coast | |
| | | Ports | 128 |

C

| | |
|-------------------------------------|-----|
| Cahp Rocks and Light | 255 |
| Caleutta | 11 |
| do. Port Rules | 30 |
| do. Bye-Laws | 35 |
| Calicut | 237 |
| do. Light | 239 |
| Calimere Point and Light | 159 |
| Calingapatam and Light | 59 |
| Calmoene Point | 184 |
| Cannanore | 216 |
| Chandbully | 50 |
| Chank Fishery | 173 |
| Chaul Kadu Reefs | 297 |
| Chilaw | 211 |
| Chiquilim Point | 276 |
| Chiplum | 291 |
| Chitavalasa | 61 |
| Choorpulti Sands | 291 |
| Clarke Point | 188 |
| Cocanada | 72 |
| Coast Ports, Instructions regarding | 107 |
| Cochin | 227 |
| do. Tonnage Scale | 233 |
| do. Pilotage Fees | 235 |
| Coimapatam | 170 |
| Coleroon Shoal | 152 |
| Colombo | 194 |
| do. Port Rules | 201 |
| do. Port Dues | 210 |
| do. Chamber of Commerce | |
| Fees | 203 |

D

| | |
|--------------------------------|-----|
| Dabhol | 291 |
| Dart Rock | 271 |
| Dasgum | 293 |
| Delft Island | 184 |
| Delli, Mount | 249 |
| Deria Bahadur Ghur | 255 |
| Deumba Dava Rocks | 192 |
| Dewgad | 285 |
| Diamond Harbour Lights | 23 |
| Devgad Point | 293 |
| Dindi House | 81 |
| Divi Point | 81 |
| Dolphin's Nose | 68 |
| Dolphin Rock Light | 303 |
| Dondra Head Light | 191 |
| Dowdeswell Island | 52 |
| Dowlashwaram | 72 |
| Drunken Sailor Rock | 194 |
| Dumankul Bay | 289 |

E

| | |
|--------------------------------------|-----|
| Edward's Pillar | 191 |
| East Rock | 282 |
| Eastern Channel Light-vessel | 21 |
| Elephant Island | 186 |
| Elephanta Island and Reef | 305 |
| Ennore | 85 |
| Erminia Galle | 191 |
| Ethiopia Shoal | 185 |
| Explosives' Act, Rules under | 40 |

F

| | PAGES |
|-----------------------------------|-------|
| Falkland Rock | 304 |
| False Head | 189 |
| False Point | 52 |
| Do. Light | 53 |
| Fees, Measuring and Surveying in | |
| Madras Presidency | 112 |
| Finger Peak | 148 |
| Fisherman's Point Light | 23 |
| Flagstaff Shoal | 304 |
| Fortified Island | 272 |
| Foul Point Light | 188 |
| Friar's Hood | 189 |
| Fungus | 290 |

G

| | |
|------------------------------|-----|
| Galle | 191 |
| do. Light | 193 |
| Ganjam | 56 |
| Gara Hill | 59 |
| Gaspar Channel | 16 |
| General Pass Rules | 136 |
| Gersoppa | 272 |
| Gindura Rock | 192 |
| Goa | 280 |
| Godaveri Point | 74 |
| Godhully Peak | 274 |
| Gopalpore | 56 |
| Green Island | 216 |
| Gunner's Quoin | 188 |

H

| | |
|-----------------------------|----------|
| Hambantotti | 190 |
| Hangarakatta | 256 |
| Harihareshwar | 292 |
| Hare Island Light | 170 |
| Havelock Rock | 281 |
| Henery Island | 299 |
| Himutgarh | 293 |
| Hingladevi Temple | 296 |
| Hog Island | 271, 306 |
| Holi Hill | 287 |
| Honawar | 271 |
| Hookey Tollah | 52 |
| Hope Island | 75 |
| Horse Shoe Bank | 164 |

PAGE#

| | |
|--|-----|
| Hosdrug | 249 |
| Houses of Refuge at Sunderbans | 24 |
| Hugli River | 19 |
| Hurnai | 292 |

I

| | |
|-------------------------------------|----|
| Intermediate Light-vessel | 20 |
| Investigator Rock | 58 |
| Iperpalium | 81 |
| Isakapilli | 83 |

J

| | |
|--------------------------------|-----|
| Jaffnaputnam | 184 |
| Jaigar or Jaigad | 289 |
| Jaitapur | 286 |
| Janjira | 294 |
| Johnston Castle Rock | 284 |
| Jugamuth Pagoda | 54 |
| Jumbao Bungalow | 52 |

K

| | |
|---------------------------------------|-----|
| Kadachadri | 269 |
| Kadda Rocks | 191 |
| Kalasagrputam | 171 |
| Kalbadavi Bay | 288 |
| Kallai | 243 |
| Kalpentin Island | 211 |
| Kulpi Light | 22 |
| Kundivalasa Peak | 61 |
| Kangasenturai and Light | 185 |
| Kansa Fort | 295 |
| Kantabaria Light | 23 |
| Kanthê Thuki Reef | 164 |
| Kapera Rocks | 192 |
| Karikal Light | 154 |
| Karil Rock | 283 |
| Karativo Island | 211 |
| Kardeshwar Point and Temple | 290 |
| Karwar | 274 |
| Kasaragode | 250 |
| Katembera Rocks | 192 |
| Kata Rocks | 192 |
| Kavoi | 249 |

| | PAGES |
|-----------------------------------|-------|
| Kenery Island Light | 298 |
| Kettle Bottom Hill | 85 |
| Kerbela Rock | 187 |
| Kidderpore Graving Dock | 42 |
| Kilakarai | 168 |
| Kistna Light | 80 |
| Kolaba Shoals | 302 |
| Kolachel | 219 |
| Konada | 61 |
| Korlai | 296 |
| Kooramallai | 211 |
| Kota Islet | 218 |
| Kottacoon Hill | 237 |
| Kottapatam | 82 |
| Kottaiputam | 160 |
| Kovilum Point | 184 |
| Kudaripu | 185 |
| Kudre Mukh | 251 |
| Kumbam Point | 293 |
| Kumbala | 250 |
| Kumbla and Light | 272 |
| Kundapur and Light | 258 |
| Kundagul Harbour | 164 |
| Kurusuddi Island | 164 |

L

| | |
|-------------------------------------|-----|
| Laccative Islands | 260 |
| Light Dues | 127 |
| Londa | 278 |
| Long Sand Light vessel | 19 |
| Lower Gaspar Light-Vessel | 20 |

M

| | |
|---|-----|
| Madras | 88 |
| do. Harbour Trust Bye-Laws | 135 |
| do. Chamber of Commerce Rules | 93 |
| do. Port Dues | 95 |
| do. Port Rules | 101 |
| do. Port Signals | 111 |
| do. Tonnage Scale | 327 |
| do. Pilotage Fees | 135 |
| Mahabalipuram Light | 147 |
| Mahanadi Point | 52 |

| | PAGES |
|---------------------------------------|-------|
| Mahé and Light | 243 |
| Malapuram | 235 |
| Malet Shelf | 313 |
| Maldivé Islands | 212 |
| Malpe | 256 |
| Malwan and Light | 284 |
| Manaar Islands | 212 |
| Manapad Light | 171 |
| Mandapan | 162 |
| Mandel Rock | 284 |
| Mandi Tivo | 184 |
| Mangalore | 251 |
| Manjeshwar | 250 |
| Maproe | 293 |
| Marad | 295 |
| Marmagão | 276 |
| Masulipatam and Light | 79 |
| Matamada Rocks | 192 |
| Meria Peak | 288 |
| Middle Ground Shoal | 303 |
| Minicoy Island and Light | 215 |
| Meria Donghur Headland | 288 |
| Modregam Point | 212 |
| Mody Bander Light | 312 |
| Mount Lavinia | 194 |
| Mulki | 254 |
| Mullaitivu Shoals and Light | 186 |
| Munayai Paru | 188 |
| Musargagi Tower | 287 |
| Mutapolli Bank | 82 |
| Mutlah Light-Vessel | 22 |
| Muttum Light | 218 |

N

| | |
|---------------------------|-----|
| Nagore | 155 |
| Narrakal | 235 |
| Narsapur Point | 76 |
| Negapatam | 156 |
| Negombo | 211 |
| Neori Point | 288 |
| Neptune Battery | 193 |
| Nilot Point | 245 |
| Nizampatam | 81 |
| North Pap | 302 |
| North Patch | 304 |
| Nuti Point | 283 |

O

| | PAGES |
|---------------------------------|-------|
| Oil as a Sea Smoother | 351 |
| Ostenburg Point | 186 |
| Oyster Rocks Light | 275 |

P

| | |
|---|----------|
| Paale Tivo | 184 |
| Palanur River | 148 |
| Palk Straits | 158 |
| Palmyras Point and Shoals | 52 |
| Pamban | 161 |
| do. Light | 165 |
| Panjim | 279 |
| Patna Rock | 219 |
| Pearl Fishery | 173 |
| Patnurmudur | 168 |
| Pedapalli | 81 |
| Pedro, Point | 185 |
| Pentakota | 69 |
| Petroleum Act, Rules under | 43 |
| Pigeon Islands | 271, 191 |
| Pilotage Fees, Calcutta | 28 |
| do. do. Bombay | 314 |
| do. do. Colombo | 195 |
| do. do. Galle | 191 |
| do. do. Madras | 135 |
| do. do. Cochin | 235 |
| do. do. Pamban | 167 |
| do. do. Kelakarai | 167 |
| Pilot's Ridge Light-Vessel | 21 |
| Pir Balu | 291 |
| Point Calimere | 159 |
| Point de Galle | 191 |
| Point Divi | 81 |
| Polkatti Rocks | 192 |
| Ponani | 236 |
| Pondera Church | 220 |
| Pondicherry | 148 |
| Poondy | 59 |
| Porto Novo | 151 |
| Port Rules for Madras Coast Ports | 120 |
| Primeira Rocks | 255 |
| Princes Dock Lights | 312 |
| Prongs Light | 302 |
| Pudimodaka | 69 |
| Pulicat Light | 85 |

PAGES

| | |
|-----------------------------|-----|
| Pulli Island | 164 |
| Pudi Shoal | 84 |
| Puma East Channel | 164 |
| Pungre Tivo | 184 |
| Puri and Light | 54 |
| Pulunny Rock | 219 |

Q

| | |
|--------------------------------------|-----|
| Quarantine Rules, Calcutta | 34 |
| do. do. Madras | 116 |
| do. do. Colombo | 202 |
| do. do. Bombay | 320 |
| Quilandi | 211 |
| Quilon | 221 |

R

| | |
|---|-----|
| Rai | 290 |
| Rairi Rock | 281 |
| Rajapur | 286 |
| Rajpuri Point | 295 |
| Ramaseram Island | 161 |
| Ramen Island | 164 |
| Rafi Beacon | 59 |
| Ratnagiri | 287 |
| Rattam Point | 190 |
| Reddie Head | 52 |
| Refuge Houses (Sunderbuns) | 24 |
| Regulations for preventing collisions at Sea | 312 |
| Rewadanda | 296 |
| Rockingham Patches | 147 |
| Round Island and Light | 186 |

S.

| | |
|---|-----|
| Sacramento Shoal and Light | 75 |
| Sacrifice Rock | 242 |
| Sadashivgad Bay | 274 |
| Saddle Hill | 189 |
| Saint Mary's Islands | 255 |
| Saint George's Islands | 276 |
| Sandheads, Instructions regarding | 25 |
| Sangameshwar River | 289 |
| Santapilli Light and Rocks | 61 |
| Satara Reef | 60 |
| Sangor Island Light | 23 |

| | PAGES | | PAGES |
|------------------------------------|-------|-------------------------------|-------|
| Suvarandroog | 292 | Trimalavassal | 163 |
| Secretario Island | 276 | Tripalore Reef | 147 |
| Semaphores (Hugli River) | 46 | Trivandrum | 220 |
| Seven Pagodas Light | 147 | Tuticorin and Light | 168 |
| Shallinger Shoal | 83 | Tucker Patch | 305 |
| Shah Jehan Shoal | 293 | Tulsi-parwal Point | 273 |
| Shastri River | 289 | | |
| Shewa Beacon | 306 | | |
| Shingle Islands | 161 | | |
| Shirur | 259 | | |
| Shrivardham | 293 | | |
| Shortt's Island Light | 51 | | |
| Sindhudrug Fort | 281 | | |
| Snail Rock | 273 | | |
| Sonapore | 58 | | |
| Soonta Creek | 52 | | |
| South Rock | 282 | | |
| South-West Point Rock | 283 | | |
| Storm Signals, Hugli | 16 | | |
| do. do. Madras | 114 | | |
| do. do. Bombay | 322 | | |
| Square Rock | 283 | | |
| Sugar Loaf Hill | 65 | | |
| Sunk Rock Light | 302 | | |
| Surveyor Rock | 189 | | |

T

| | |
|--------------------------------------|-----|
| Tadri and Light | 273 |
| Tangalle Point | 191 |
| Tangacherri Reef and Light | 223 |
| Tartar Rock | 191 |
| Tellicherry and Light | 213 |
| Temple Tree | 53 |
| Thal Knob | 302 |
| Tiger Hill | 283 |
| Tikkodi Point | 242 |
| Tilly Rock | 303 |
| Tolkeshwar and Light | 290 |
| Tonituri Temple | 164 |
| Tondi Light | 161 |
| Tower Hill | 188 |
| Tranquebar | 153 |
| Trincomalee | 186 |
| Trichendore Pagoda | |

U

| | |
|----------------------------------|-----|
| Unawatti Point | 191 |
| Undari | 299 |
| Upper Gaspar Lightship | 20 |
| Uran Shoal | 301 |

V

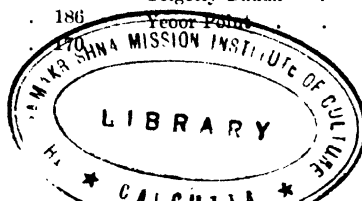
| | |
|----------------------------------|-----|
| Vakalapudi Light | 73 |
| Varakal | 241 |
| Vellikoko Rocks | 192 |
| Vendelus Bay and Point | 188 |
| Victoria Dock Lights | 313 |
| Victoria Fort | 292 |
| Vingorla and Lights | 282 |
| Vizagapatam | 65 |
| Viziadrag | 286 |
| Vypean Point | 230 |

W

| | |
|---|-----|
| Waltair | 66 |
| Warkalli | 220 |
| Washistri River | 291 |
| Watering Point | 193 |
| Weather Signals (Madras) | 118 |
| Wellington Patch | 303 |
| Westminster Abbey | 189 |
| Whale Rock | 192 |
| Wharf and Warehouse Company's Fees, etc. (Colombo) | 205 |

Y.

| | |
|--------------------------|-----|
| Yashwantgar | 287 |
| Yelgetty Gudda | 269 |
| Yecoor Point | 295 |



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